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OCCASIONAL PAPERS

OF THE

BERNICE PAUAHI BISHOP MUSEUM OF POLYNESIAN ETHNOLOGY AND NATURAL HISTORY

VOLUME V.

HONOLULU, H. I.
BISHOP MUSEUM PRESS.
1913.

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OCCASIONAL PAPERS

OF THE

BERNICE PAUAHI BISHOP MUSEUM OF POLYNESIAN ETHNOLOGY AND NATURAL HISTORY.

Vol. V.—No. 1.

NEW HAWAIIAN PLANTS.—III.

PLANT INVASION ON LAVA FLOWS.

HONOLULU, H. I.
Bishop Museum Press.
1912.

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New Hawaiian Plants.—III.

CHARLES N. FORBES.

DECEMBER, 1911.

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Hibiscus kahilii, sp. nov.

Arbor 75–90 dm. alta; foliis ellipticis vel cuneiformis, serratis, scabro-pubescentibus, 5–6 cm. longis, 2.5–.5 cm. latis; petiolis pubescentibus, .5–1 cm. longis. Flores solitarii, axillares; pedunculis pubescentibus, articulatis prope summis, 1.5–2 cm. longis; involucro-bracteis lanceolatis, pubescentibus, 11 mm. longis; calyce tomentosi, tubulato, brevi dentato, marginati, 2.5–2.7 cm. longo; petalis oblongo-spatulatis, rubris, extus pubescentibus, 6.5 cm. longis, 11 mm. latis; columna staminea 5 cm. longa, stylis hirsutis, 9 mm. longis. Capsula ignota.

Type locality, near the Wahiawa swamp, on the slopes of Kahili, Kauai. Specimens first collected by Mr. J. M. Lydgate a number of years ago. C. N. Forbes, No. 259, K. August, 1909.

A tree 75–90 dm. high. Leaves elliptical to cuneiform, serrate on the upper two-thirds, lower third generally entire, scabro pubescent, 5–6 cm. long, 2.5–3.5 cm. wide; with pubescent petioles of .5–1 cm. long. Flowers solitary in the axils; with pubescent peduncles, articulate near the top, 1.5–2 cm. long. Involucral bracts lanceolate, pubescent, 11 mm. long. Calyx pubescent, tubular, marginate, shortly dentate, 2.5–2.7 cm. long. Petals oblong-spatulate, red, pubescent on the outside, 6.5 cm. long, 11 mm. wide. Staminal column 5 cm. long. Styles hirsute, 9 mm. long. Capsule unknown.

This species differs from *H. kokio* Hillebr. in its pubescent calyx, and in other minor characters. A red hibiscus growing on Hauopu, Kauai, although very different in habit, has flowers very similar, and is probably a variety. Another specimen, originally from Napali, which has been under cultivation a number of years in Mr. Lydgate's garden at Lihue, Kauai, is probably another species, or distinct variety. It has much shorter involucral bracts, and a wider corolla of a different shade of red. As I have never seen it in its native locality, I hesitate to describe it at present. I observed still another form, growing on the cliffs near Kalalau, which I was unable to obtain, which had a staminal column which protruded beyond the petals.

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HIBISCUS KAHILII FORBES.

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Kadua fluviatilis, sp. nov.

Frutex 6–9 dm. alta; foliis lanceolatis, acuminatis, basi acuminata, glabris, 21 cm. longis, 4.5 cm. latis, cum petiolis 2.5 cm. longis; stipulis triangularis, mucronatis. Flores axillares vel sub-axillares; pedicellis 2.5 vel 4 cm. longis; calycis lobis lanceolatis, 11 mm. longis; corolla alba, glabra; tuba 2 cm. longa, lobis reflexis, 9 mm. longis; antheris linearis, sessilis, inclusis; stilo glabro, bifido, 7 mm. longo; lobis 4 mm. longis, linearis. Capsula obconica, calycis laciniis coronata; seminibus angulariis, marginatis, minutissimis pustulatis.

Type locality, on the borders of the upper Wahiawa stream, Oahu. To be expected along the streams of the Koolauloa mountains, Oahu. C. N. Forbes, No. 1621, O. December 18, 1910.

Bushy, 6–9 dm. high. Leaves lanceolate, acuminate, base acuminate, glabrous, 21 cm. long, 4.5 cm. wide, with petioles 2.5 cm. long. Stipules triangular, mucronate. Flowers axillary or sub-axillary, on pedicels 2.5–4 cm. long. Calyx lobes lanceolate, 11 mm. long. Corolla white, glabrous, tube 2 cm. long, lobes reflexed, 9 mm. long. Anthers linear, sessile, inclosed below the throat. Style glabrous, bifid for one-third of its length, with broad linear lobes. Capsule obconical, strongly marked by four ridges, alternating with four grooves, drawn out into the slightly elongated pedicel, crowned by the calyx lobes. Seeds angular, margined, minutely pustulate.

This species is closely related to *Kadua acuminata* Cham. & Schl., but is very different in appearance. Its leaves are larger and more typically acuminate than *K. petiolata* Gray, while its flowers are pure white, the latter species having greenish flowers. The corolla is considerably longer and larger than in these two species.

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KADUA FLUVIATILIS FORBES.

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Clermontia tuberculata, sp. nov.

Arbor 45 dm. alta; foliis obovatis vel oblongis, serrulatis, coriaceis, glabris, cum nerviis subter minutim tuberculatis, 19.5 cm. longis, 4 cm. latis, petiolis 2–3 cm. longis; pedunculis bi-floribus vel uni-flori, 5 mm. longis, pedicellis 3 cm. longis cum parvis tuberculatis. Flores grandes; calyce tubo campanulato, extero tuberculato, 1.7 cm. longo, cum lobis obtusis, tuberculatis, 3 mm. longis; corolla carnosa, parum curvata, extera tuberculata, viride, intra rubre 5 cm. longa; antheris rubris, glabris. Bacca globosa tuberculosa, 1.3 cm. crassa, seminibus ovoidis, levibus, flavis.

Type locality, wet woods on the slopes of Haleakala, Maui, to the east of and between Olinda and Ukulele. C. N. Forbes, No. 201, M. July, 1910.

A tree about 45 decimetres high, with the habit of *Clermontia arborescens* (Mann) Hillebr. Leaves obovate to oblong, serrulate, glabrous, coriaceous, the veins on the under side minutely tuberculate, 19.5 cm. long, 4 cm. wide, with petioles 2 to 3 cm. long. Flowers in cymes or single, the peduncle 5 mm. long, pedicels 3 cm. long, both covered with small tubercles. Calyx tube campanulate, with short obtuse lobes, covered with tubercles on the outside. Tube 1.7 cm. long, lobes 3 mm. long. Corolla thick, fleshy, slightly curved, covered with tubercles of a reddish tinge on the outside, green on the outside, a dark rich reddish color on the inside, 5 cm. long. In maturing the lobes converge, the lower lobes split about half way down the tube, the upper nearly to the base as in *Clermontia grandiflora*. Anthers dark red, glabrous. Berry globose, glabrous, strongly tuberculate on the outside, 1.3 cm. in diameter. Seeds smooth, yellow, shiny, and ovoid.

This species belongs to the group *Clermontioideae* as constituted by Hillebrand. While very distinct from other species, I believe it is most closely related to *Clermontia arborescens* (Mann) Hillebr.

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CLERMONTIA TUBERCULATA FORBES.

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Rollandia parvifolia, sp. nov.

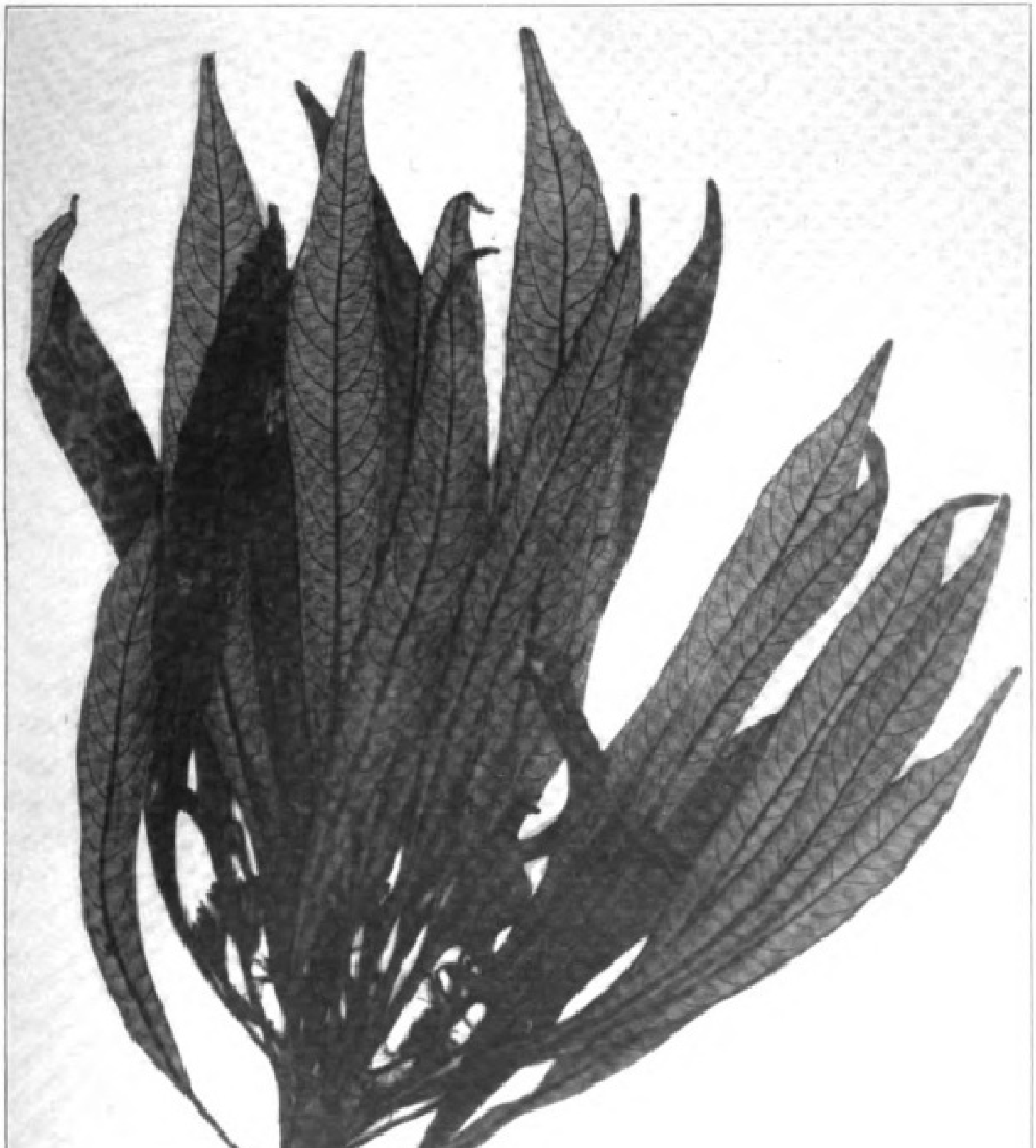
Caulis 9 dm. altus; foliis lanceolatis, acuminatis, apexe cum minuto microni, integerrimis, glabris, coriaceis, subter albidis, cum petiolis 4.8 cm. longis, 2.3-4 cm. latis; floribus 5-6 in racemis, pedunculo 3-4 cm. longo, pedicellis 1 cm. longis, glabris. Flores grandi; calycis tubis cylindricis, glabris, 8 mm. longis, lobis oblongis, obtusis, minutim mucronatis, 1 cm. longis; corolla purpurea, sigmoidea, 6.5 cm. longa; columna staminea adnata, supera pubescens; antheris pubescentis. Bacca ignota.

Type locality, Waioli valley, Kauai. Only one specimen was seen amongst the dense undergrowth on a wet talus slope. C. N. Forbes, No. 103, K. August 1, 1909.

Single stem 9 dm. high. Leaves lanceolate, acuminate with a minute mucro at the apex, gradually narrowing from the upper third to the petiole, entire, glabrous, coriaceous, pale whitish below, 18–22 cm. long, 2.3-4 cm. wide; with petioles 2.8 cm. long, which are occasionally sparingly marked with small lenticels. Flowers five to six in a raceme, the peduncles 3-4 cm. long, bibracteate, the pedicels 1 cm. long, bracteolate above the centre, glabrous. Calyx tube cylindrical, glabrous, 8 mm. long; with the lobes oblong, obtuse, minutely mucronate, thin, 1 cm. long. Corolla purple, strongly sigmoid, 6.5 cm. long, the lower lobes split less than one-half the distance of the tube, 1.5-2 cm. long. Staminal column adherent to the corolla for about one-third its length, the upper half puberulent, as long as the corolla. Anthers puberulent. Berry not seen.

This is the first *Rollandia* to be reported off the island of Oahu. Its arrangement of characters easily separates it from the other species, while its relatively much smaller leaves give it quite a different appearance in the field.

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ROLLANDIA PARVIFOLIA FORBES.

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Cyanea undulata, sp. nov.

Caulis 18–36 dm. altus; foliis lanceolatis, integerrimis, acuminatis, proxime marginibus undulatis, apexe interdum spirali, basi acuminata, subter hispidulis, coriaceis, nerviis subter rubigo-tomentosis, 36 cm. longis, 4 cm. latis; cum petiolis rubigo tomentosis, 5 cm. longis; floribus in racemis, pedunculis 4.3 cm. longis, pedicellis 1 cm. longis, rubigo-tomentosis. Flores (in gemma); calyci hirsuta, cylindrica, lobis triangularis, acutis, 4 mm. longis; corolla intra et exteriora rubigo-tomentosa, curvata, luteola; columna staminea hispidula, 22 mm. longa; antheris elegantis, glaberimis, 7 mm. longis. Bacca obovata, luteola, rubigo-fulvis, 17 mm. longa, 11 mm. crassa; seminibus obovoidis, levibus.

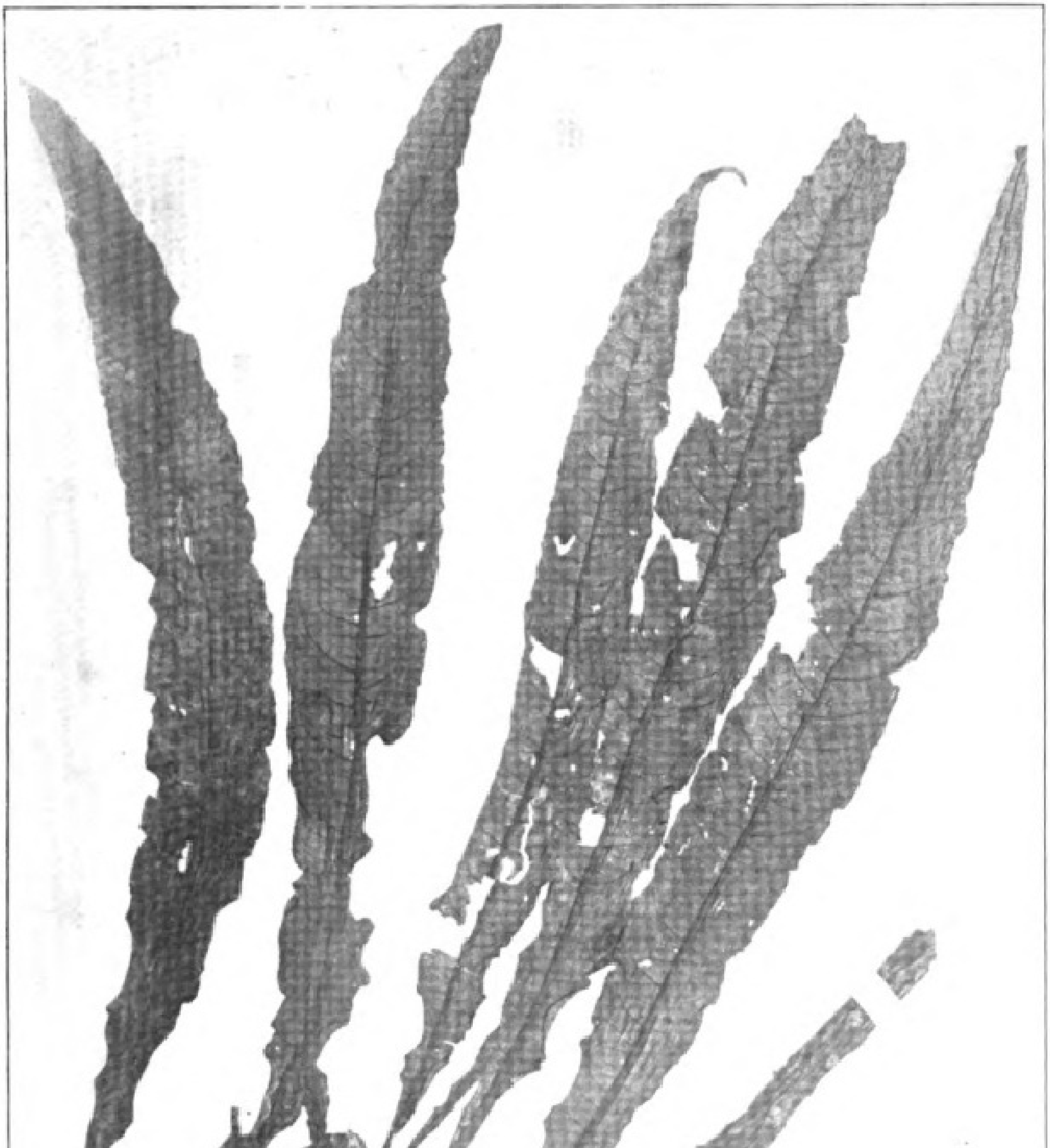
Type locality, damp woods surrounding the Wahiawa swamp, Kauai. Specimens were first sent me by Mr. J. M. Lydgate, who has thoroughly explored this region for a number of years. C. N. Forbes, No. 292, K. August, 1909 (fruit). J. M. Lydgate, May, 1908 (flower buds).

Single stem 18–36 dm. high. Leaves lanceolate, entire, acuminate, undulating near the edges, or the edges sometimes irregularly turned over, the apex sometimes spirulate, coriaceous, hispidulous on the under side, the veins on the under side rusty-tomentose, 36 cm. long, 4 cm. wide; with rusty-tomentose petioles 5 cm. long. Flowers 5–6 in racemes, peduncle 4.3 cm. long, pedicels 1 cm. long, both rusty-tomentose. Flowers in the bud. Calyx hirsute, cylindrical, the lobes triangular, acute, 4 mm. long. Corolla hirsute on the outside and inside, slightly curved, yellowish. Staminal column hispidulous, 22 mm. long. Anthers elongate, glabrous, 7 mm. long. Berry obovate, yellow, 17 mm. long, 11 mm. thick. Seeds obovoid, smooth, dark reddish brown.

This species can be easily recognized in the field by the unique appearance of its leaves.

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CYANEA UNDULATA FORBES.

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Preliminary Observations Concerning the Plant Invasion on Some of the Lava Flows of Mauna Loa, Hawaii.

CHARLES N. FORBES.

DURING an excursion on the island of Hawaii for the purpose of collecting botanical material for the Bishop Museum, an admirable opportunity was offered for making observations on the colonization of a portion of the lava flows of Mauna Loa. Although a limited portion of the mountain has been covered, and observations of this character should extend over a number of years, it is believed that data of enough local interest was obtained for record at this time.

The region visited extends from Puuwaawaa, over the summit of Hualalai, through the districts of Kona and Kau, mainly at an elevation of 4500 feet, which is just above the dense forest belt. One trip was made to the summit of Mauna Loa on the Kailua side, and from numerous localities the forest was penetrated in all directions; the region below the Government road in Kona and the shore line being the only portions from which a representative collection of plants was not taken.

This territory is on the dry or lee side of the island, and for that reason the naturalization of plants on the lava flows may vary somewhat from that of the moister regions; but it is believed that the main factors will prove to be the same, except for rapidity of invasion. The general characteristics of the Hawaiian vegetation have been described by several writers,[1] and in this paper it is the intention to discuss only the flora in the immediate vicinity of the flows visited.

There is probably no better locality in the world for observing the colonization of lava flows than the slopes of Mauna Loa. The

[1] Hillebrand, W.: Flora of the Hawaiian Islands, 1888. Guppy, H. B.: Observations of a Naturalist in the Pacific, vol. ii. Hall, W. L.: The Forests of the Hawaiian Islands, U. S. D. A., Dept. Forestry, Bul. 48, 1904.

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whole mountain is a gigantic mass of these lava streams which radiate on all sides from the summit, 13,675 feet, to sea level. The later flows have generally arisen from sources below the summit. The different flows have had irregular courses. Many of them in flowing over older streams have left areas of various sizes of the older flow surrounded on all sides by the newer flow, without apparently harming the vegetation of the resulting island to any appreciable extent. The surrounded areas, known to the natives as "kipuka," may be above or even below the surface of the surrounding flow. Fortunately for a study of this sort the age of many of these flows is known.

The lava flows are of two kinds, generally simply described as the smooth or slaggy, and the rough or scoriaceous; but as these regions differ so much from the country generally traversed by botanists, I quote the fuller word picture of Dana.[2] "There is the ordinary smooth-surfaced lava called pahoehoe, the term signifying having a satin-like aspect. The surface of the lava cooled as it flowed. Through one means and another the surface is usually uneven, being often wrinkled, twisted, ropy, billowy, hummocky, knobbed, and often fractured......The other most prominent kind of lava stream is the aa. The aa streams have no upper flow-like surface; they are beds of broken up lava, the breaking of which occurred during the flow. They consist of detached masses of irregular shapes, confusedly piled together to a height sometimes of twenty-five to forty feet above the general surface. The size of the masses is from an inch in diameter to ten feet and more. The lava is compact, usually less vesiculated than the pahoehoe, not scoriaceous; but externally it is roughly cavernous, horribly jagged, with projections often a foot or more long that are bristled all over with points and angles. In some cases ragged spaces extend along planes through the large masses, like those of the exterior." Both kinds of lava may be represented in the same flow, either in different parts or closely associated. Many hundreds of these two classes of flows were passed over during the excursion.

The first flow of known date visited was that of 1859. This flow was followed from a point west of Puuwaawaa down to where it crosses the Government road. It is composed of both aa and

[2] Dana, J. D.: The Characteristics of Volcanoes, 1891, p. 9.

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pahoehoe. The aa assumes the position of a winding river through the pahoehoe. In places the pahoehoe has flowed around portions of the aa in an irregular manner, leaving sunken islands of aa varying from a few feet to half an acre in area. From the close interrelations between the two there is no doubt that both belong to the same flow. The pahoehoe is jet black and new looking, while the aa has a chocolate tinge, it also appearing very new as compared to adjacent flows.

After several hours spent on the flow it became apparent that, with the exception of the lower cryptogams, most of the vegetation was supported on the pahoehoe and not on the aa. As this was contrary to what I had expected and had heard generally expressed on these islands, I gave particular attention to this point, and also directed my guide to call my attention to any plants he might see on the aa. A portion of the aa stream was followed for a considerable distance down the centre, but nothing was obtained save a liberal supply of cuts and bruises. This scarcity of plants was even true for the small sunken areas of aa, which of all places one would think would be admirable traps for catching seeds and spores. The aa portions of the flow are often white with a certain lichen, and a closer search reveals an occasional moss, but there are no ferns or phanerogams, except on the contact line with the pahoehoe.

The plants which occur on the pahoehoe are to be found growing in the numerous small cracks which cross the flow in various directions, especially where the flow is at all billowy, and between the folds of the ropy lava. The smoother portions are entirely bare of any vegetation. Such cracks act as riffles to catch either disintegrated particles of the flow itself, or dust and other refuse which may be blown over the smooth portions from the outside. At one place I noticed several hundred dead shells of *Eulota similaris* being blown across a portion of the flow, many of them being caught in the cracks. Such soil is stopped on the edge of an aa flow, while apparently not enough accumulates by the weathering of the flow itself in this period of time to fill its smallest spaces.

The following plants were observed scattered here and there in the cracks on the pahoehoe, but they were in no case in suffi-

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cient quantity to be conspicuous from a distance. A longer search would probably add quite a few more species to the list:

FILICES.[3]

Asplenium praemorsum Sw. (*Asplenium furcatum*, Thbg.)
Asplenium trichomanes L., var. (*Asplenium densum* Brack.)
Diellia erecta (?) Brack. (*Lindsaya erecta* Hook.)
Doryopteris decora Brack. (*Pteris decora* Hook.)
Pellaea ternifolia (Cav.) Link.
Psilotum nudum (L.) Griesb. (*Psilotum triquetrum* Sw.)
Polypodium pellucidum Klf. var. The folded form.
Sadleria cyatheoides Klf.

PHANEROGAMS.

Cyperus sp.
Amaranthus spinosus L.
Rumex giganteus Ait.
Osteomeles anthyllidifolia (Smith.) Lindl.
Meibomia uncinata (Jack.) Kuntz.
Oxalis corniculata L.
Euphorbia pilulifera L.
Sida cordifolia L.
Waltheria americana L.
Opuntia tuna (L.) Mill.
Metrosideros polymorpha Gaud., var.
Asclepias curassavica L.
Ipomaea congesta R. Br.
Verbena bonariensis L.
Plectranthus australis R. Br.
Capsicum frutescens L.
Lycopersicum esculentum Mill.
Solanum nigrum L.
Bidens pilosa L.
Erigeron canadensis L.
Gnaphalium sp.
Sonchus oleraceus L.
Raillardia sp.

etrosideros polymorpha, which is the pre-

Of the above, the most frequent species met with are *Metrosideros polymorpha*, *Polypodium pellucidum* and *Sadleria cyatheoides*. With the exception of *Metrosideros polymorpha*, which is the prevailing tree, these plants do not give a conspicuous aspect to the flora in the immediate vicinity of the flow, but constitute what might be classified as the weeds. Of the twenty-three phanerogams, sixteen belong to the naturalized flora and six to the native flora, one of the latter being of wide distribution as a shore plant.

[3] These are the names recognized in Christensen's Index Filicum, but for the convenience of local readers the names given in Hillebrand's Flora are given in parentheses.

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I believe that distribution is mainly by wind, although cattle and goats occasionally cross the flow.

Several days later this flow was again visited at a somewhat higher elevation, at a place not far distant from the Judd road, and about ten miles above Puuwaawaa. There was relatively less vegetation, but distribution was the same as observed in the first case. At this place there are several islands of an ancient aa flow which are covered with vegetation. The following plants were observed in the cracks on the pahoehoe, only the common white lichen being observed on the aa:

FILICES.

Asplenium trichomanes L., var.
Doryopteris decora Brack.
Polypodium pellucidum Klf., var. The folded form.
Sadleria cyatheoides Klf.

PHANEROGAMS.

Chenopodium sandwicheum Moq.
Argemone mexicana L. 1 plant.
Dodonaea viscosa L.
Metrosideros polymorpha Gaud., var.
Cyathodes Tameiameiae Cham.
Verbena bonariensis L.
Solanum nigrum L.
Erigeron bonariensis L.
Gnaphalium sandwicensium Gaud.
Sonchus oleraceus L.

Of the ten phanerogams, five are native and with *Sophora chrysophylla*, which was not observed on the flow, constitute the prevailing flora of the surrounding region. The remaining five belong to the naturalized flora. The prevailing plants on the flow were *Metrosideros polymorpha*, *Polypodium pellucidum* and *Sadleria cyatheoides*.

Dr. W. T. Brigham[4] visited this flow in 1864. He reports having observed ferns in some of the caves, and a *Polypodium* on the surface cracks, but lichens were rare.

From a station called Honomalino the flows of 1887 and 1907 were visited. The flow of 1887 was observed at the place where it branches and flows around a cone called Puu Ohia.[5] Both

[4] Dr. W. T. Brigham: Volcanoes of Kilauea and Mauna Loa. B. P. B. M. Mem., vol. ii, no. 4, p. 16.

[5] This cone is called Puu Ohohia on the Government map.

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branches were composed of extremely rough aa and supported no vegetation, with the exception of a few *Metrosideros* on the contact edges with the older flows.

The 1907 flow was visited at a point a short distance above Puu o Keokeo, which is about two and one-half miles above Puu Ohia. At this point the flow is entirely pahoehoe, very shiny black and fresh looking. Plants were just beginning to be established in a few of the cracks, the following being observed:

Polypodium pellucidum Klf., var. The folded form.	*Vaccinium penduliflorum* Gaud.
	Cyathodes Tameiameiae Cham.
Cyperus sp.	*Raillardia* sp.

All of these plants are indigenous and constitute the prevailing flora at this elevation. The naturalized flora is not yet established to any considerable extent on this portion of Mauna Loa.

The 1907 flow was visited later at the place where it crosses the Government road on the Kona side. At this point it is aa and supports no vegetation except an occasional lichen or moss, apparent only on minute examination.

The flow of 1823 was visited where it crosses the Kau Desert. It is pahoehoe, but unfortunately much of the vegetation had been eaten by goats just before my visit. In a deep crack which crosses the flow, practically all the species of plants which occur in the surrounding region were observed. The following plants were observed in the surface cracks:

Cibotium sp.	*Metrosideros polymorpha* Gaud., var.
Nephrolepis exaltata (L.) Schott.	
Psilotum nudum (L.) Griesb.	*Solanum nigrum* L.

Another recent but unrecorded aa flow was visited above Kapapala near the old Kahuku trail. With the exception of a few lichens, no vegetation was observed upon it.

From these observations of the plant invasion on the flows of known date the following summary might be obtained:

1. A few lower cryptogams, followed by ferns and phanerogams first become established on the pahoehoe.

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2. Lower cryptogams become established on the aa at an early date, and eventually cover the flow to a considerable extent, some of these species being rather rare on the pahoehoe.

3. Ferns and phanerogams only become established on the aa a long period of time after these become established on pahoehoe of the same age, other conditions being the same.

4. The plants to be found on the new flow are the same as those found on older flows in the immediate vicinity. *Polypodium pellucidum*, *Sadleria cyatheoides* and *Metrosideros polymorpha* were usually the prevailing plants at all points and elevations studied on the pahoehoe, while a species of white lichen was usually common on the aa.

5. A fertile soil is apparently formed in the cracks of the pahoehoe sooner than amongst the aa particles.

Metrosideros polymorpha is one of the important plants which prepare the way for the establishment of many plants on the flow. The roots spread over the smooth portions of the flow, often from one crack to another, forming pockets to catch a soil formed of dead leaves and other debris.

In viewing the older flows it is rather difficult to ascertain their relative ages, for the reason that the Hawaiian flora assumes its mature form at an early date. In passing over many hundreds of flows the prevailing characteristics of invasion were found to be somewhat as shown in the following paragraphs.

In the scrub region above the wet forests there is no great distinction between the flora of the pahoehoe and the aa. The latter, however, has a greater proportion of lichens, occasionally these plants occupying the aa to the exclusion of all other vegetation. The prevailing plants are *Cyathodes Tameiameiae*, *Dodonaea viscosa*, scrub *Metrosideros polymorpha*, *Sophora chrysophylla* and other characteristic mountain plants. Large portions of either variety of flows are bare rock, and when a soil is formed it is usually a very thin layer, limited almost exclusively to the pahoehoe.

In the dense forests of the rainy belt there is usually a good soil on the pahoehoe varying from six inches to a few feet in depth, sometimes only the tops of the billows remaining in sight to record the character of the flow. The aa, however, with few exceptions, still retains its rough file-like character. I find that

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the dense koa forests where *Acacia koa* is the prevailing tree, with a thick undergrowth of ferns, labiates and innumerable other species, are limited with remarkably few exceptions, as far as the forests of Kona are concerned, to the pahoehoe.

From any hill the traveler through this district can pick out the aa flows from a distance by the lines of ohia (*Metrosideros polymorpha*) forests, which divide the koa into sections. When he arrives at the rocky flow he will find a totally different character of undergrowth, where such plants as *Polypodium pellucidum* (folded form), *Lycopodium cernuum*, *Vaccinium penduliflorum*, *Raillardia* and certain other plants are conspicuous. From this, I believe that the koa forest is the final type for this region, and when one finds an aa flow supporting koa, it must be relatively very much older than other aa flows in the vicinity.

In later years, however, outside influences, especially cattle grazing, have considerably changed the floral aspect of the country in certain places. On account of greater ease for penetration, a more succulent undergrowth, and perhaps more available water, cattle have worked their way into the forests on the pahoehoe and destroyed the undergrowth. In a few years the introduced flora becomes established, and a park-like meadow, usually in every sense an ideal pasture, is the result. However, the indigenous trees, which after many years have become adapted to the dense undergrowth, epiphytic creepers and moist soil, are much weakened, and are not able to withstand the new, more xerophytic conditions. The weakened trees eventually fall an easy prey to destructive insects, but as far as I was able to observe were not touched by the cattle.

The cattle penetrate to a much less degree on the aa owing to its rough character, while the more xerophytic undergrowth is less succulent. When they do, the character of the flora is less changed for the reason that complete destruction of the undergrowth is impossible, while this ohia, which has not become adapted to such wet conditions as the koa, does not succumb to insect attack. Ohia varies tremendously with the habitat, but any great change in conditions would probably affect it the same as koa.

From the preceding paragraphs it must not be inferred that ohia forests are not found on some pahoehoe flows; for the damp-

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est, and consequently the densest forests on these islands are composed of this species; but the prevailing tree in the upper forests of the middle zone on the lee side of Hawaii is koa, while ohia is apparently not the final type for this section.

In the region below the wet forest the pahoehoe flows are occupied almost solely by the naturalized flora, *Psidium guajava*, *Lantana camara* and introduced weeds being very conspicuous. The long lines of native vegetation, consisting mainly of ohia, which cross the Government road in many places throughout Kona, and the rich native flora at Puuwaawaa are on old aa flows.

The region below the Government road and the shore line has not been sufficiently investigated for discussion in this paper.

In summing up the process of plant invasion on a lava flow on the lee side of Hawaii the following sequence might be obtained:

1. Appearance of lower crytogams, eventually becoming conspicuous on the aa.

2. Appearance of *Polypodium pellucidum* (folded form), *Sadleria cyatheoides* and *Metrosideros polymorpha*, first on the pahoehoe, and at a much later date on the aa.

3. Gradual development of the typical floral aspects of the immediate vicinity, if in the central region an ohia forest.

4. Establishment of the final native vegetation, if in the central region a koa forest.

5. A later stage may be the encroachment of the naturalized flora, due to a change of conditions brought about through human agency.

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OCCASIONAL PAPERS

OF THE

BERNICE PAUAHI BISHOP MUSEUM OF POLYNESIAN ETHNOLOGY AND NATURAL HISTORY.

VOL. V.—NO. 2.

Director's Report for 1911.

HONOLULU, H. I.
BISHOP MUSEUM PRESS.
1912.

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REPORT

IN reviewing the work of this Museum during the year 1911 it is gratifying to find that while the considerable labor of moving to new quarters occupied several months of the year, the total work accomplished on the regular lines of the staff work has much exceeded the average, owing in large part to the increased facilities afforded by the new laboratory. For the first time in the history of this Museum has there been suitable place under the Museum roof for both work and study in all the different departments. For the first time has each department had a separate room for work, storage of specimens, and where a scientific visitor could examine the reserve collections in comfort and without interruptions. The fuller description of the new laboratory will be given at the end of the more formal report.

The construction of the building, which had dragged through the previous year, was completed in the early spring, although the porous nature of the concrete made the application of supposed waterproof paint to the entire outside necessary, and this was not completed at the close of the year. The Museum staff were naturally anxious to move into the new and larger workrooms, but it was not until May that this was possible. At first the resounding chambers and halls in a building of one mass of concrete bound together by steel rods and network were most uncomfortable, but the use of coconut fibre matting on the painted floors of the hallways and the accumulation of furniture and cases in the rooms greatly reduced the reverberation, and custom finally made it nearly negligible.

The shell was found very convenient and our cabinet makers were able by the end of the year to provide the many shelves, tables, cabinets, racks and other utilities that have made the new

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home of the several departments very satisfactory. No important furnishing remains but the provision of steel cases for the storage of perishable treasures. With these, which are commonly admitted the best for our purpose in a tropical climate, the Bishop Museum will be in a most satisfactory position for the preservation as well as for the study of all its collections. What has already been done in the new quarters may be gathered from the following abstract of the departmental reports to the Director.

Looking first to our relations with the rest of the world the work of the printery may be reported. We have been greatly hindered by the nonarrival of important printing machinery ordered many months ago, but in spite of this, and the absence of our head printer on his well earned vacation, the usual routine work of label, notice, letterhead, etc., has not been interrupted, and our assistant printer has put through the press the final part of Volume IV of the Occasional Papers. Of the Memoirs the third volume has been issued consisting of but one part, but of nearly the bulk of the previous volumes in five and four parts issued separately. This book on the manufacture of bark-cloth, Ka Hana Kapa, with its very beautiful and valuable plates, has been well received by our correspondents and others. The final part of Volume IV Occasional Papers has been completed with index to the volume. It contains the Director's report of the work of the previous year, and a valuable paper on the Naturalized Flora of the Hawaiian Islands by Charles N. Forbes, Curator of Botany. This addition to previous lists of plants that have become naturalized in recent times on these islands will prove of no little interest to the future student of the vegetation of the Pacific islands. Volume III of the Occasional Papers has not been completed, as it was thought best to reserve this for the conchological papers which it is thought will soon be ready for publication. When our long-delayed machinery arrives our printery will be very complete and productive at a less

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expense than at present. The rooms allotted to this purpose could hardly be improved. The light is admirable in all parts, they are cool, with painted, solid concrete floors, and sufficient space. Besides the actual printing our assistant printer has been fully and usefully occupied in library work, preparing and arranging index cards, and in the more convenient arrangement of cases and books. Mr. Greene, our head printer, during his vacation visited the coast and carefully studied the most recent improvements in the printer's art, the advantages of which we hope to reap in our future publications. In spite of the drawbacks mentioned it is felt that the labor of making the treasures of the Museum accessible to the many institutions on our exchange list has been well done, and the progress made gives pleasing promise of the results to be obtained in the coming years.

The matter of housing and distributing our publications has been simplified greatly by the provision of a commodious room with ample presses for storage, and conveniences for packing and mailing. Only two new institutions have been added to our exchange list which is printed below.

Library. The list of accessions given below will show the character of the increase to our working library, but it may be stated here that the number of books and pamphlets received during the year is as follows:

In the ordinary course of purchase or exchange	448
Separates on Crustacea, Kirkaldy estate*	300
Kaiulani collection, books	128
Kaiulani collection, pamphlets	232
In all	808

In addition to these are the parts of Memoirs and Proceedings of learned societies which will be reckoned when complete volumes

*The late G. W. Kirkaldy, entomologist of the experiment station of the Planters' Association was a man of great knowledge in his profession and of most extensive reading; he was preparing to take up, as an avocation, the study of our local crustaceans, and his collection of "separates" was very valuable.

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next year. We have also had 228 volumes bound; a very important matter, as most of our exchanges come to us in parts, and for use as well as preservation must be bound.

On behalf of the library Mr. Stokes visited the attic of the Capitol in July and spent five days in selecting from the somewhat scattered stacks copies needed to complete our sets of early session laws and ministerial reports. A large list of desiderata was then submitted to the Governor with the hope expressed that the books mentioned might be deposited in the Museum library. The books were finally given to the Museum on the tenth of January, 1912.

The present rooms occupied as library were planned for taxidermy, and are temporarily occupied until we may build the more commodious structure already planned. Although the cases are not what they should be they fairly answer their temporary purpose.

Ethnology. Many additions have come to us in this department both by gift and purchase. In the former class is the bequest of the late Archibald S. Cleghorn called, as directed in the will, "The Kaiulani Collection" in memory of the late Princess. This included, besides the books already mentioned, 268 ethnological specimens, some of great interest and considerable rarity which will be illustrated in the list of accessions; 80 framed portraits, many of them of the Princess Kaiulani; and 62 unframed photographs. The framed portraits of Hawaiian royalty have been placed in the library. Among the kapa a rare specimen has been printed in colors in Ka Hana Kapa (Pl. ZZ, p. 212). Rev. W. D. Westervelt, Mrs. Charles M. Cooke, Mrs. Emil Waterman, and Mr. D. Thaanum have also added to our collections. Some of the last mentioned specimens will be separately described by Mr. Stokes.

During the summer we acquired the collection of Mr. W. C. Schiefer of Makaweli, Kauai, consisting mostly of stone, 104 Hawaiian specimens, among them a very large ring poi pounder,

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and part of a stone knife. We also purchased with funds from the Chas. R. Bishop Trust the very interesting collection of Mr. Alexander M. McBryde, formerly of Kauai. This collection numbered but 343 specimens, but among these were some of which this Museum did not possess examples, *e.g.*, kukui nut crusher, double-handled kapa beater, two hula foot plates, two abdominal lomilomi sticks, a double-pointed dagger, and a gourd scoop for catching the fry of awa. Other interesting variants of types already in the Museum were four stirrup poi pounders, a stone dish, stone lamp, and phallic emblem. It added to the value of the collection that it was made some years ago by a resident born on the Islands, who had opportunities for gathering only good specimens.

Our loan collection has increased; several old residents who have rare Hawaiian antiquities from which they are not ready to part finally have put these in charge of the Museum for safe keeping. This is also an advantage to us as an added opportunity for study: the more complete our series of Hawaiian specimens can be made the greater accuracy in the deductions from them, for it is now generally to the specimens we must look for an explanation of their manufacture and use. No exchanges of great importance have been made in this department.

The Curator, Mr. Stokes, has continued his researches on fish weirs and fish ponds, and many interesting letters have been received from other groups in the Pacific, but as there is a prospect of obtaining still more information he has decided to withhold his notes from present publication. Some time has been spent in examining the fish ponds of Kauai through the kindness of Messrs. J. K. Farley and W. H. Rice Jr.; and also in examining and photographing the fish ponds of Moanalua and Pearl Harbor.

In his very interesting and valuable study of petroglyphs he has made two visits to Keoneloa beach on Kauai where at the southeast end of this beach, under the sand and in the wash of the waves, is a sandstone ledge about 250 feet long and 30 feet wide

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closely covered with petroglyphs. Occasionally a heavy southerly storm washes the sand away and exposes for a short time portions of the ledge which are covered again as soon as the trades return. Mr. Farley of Koloa has arranged with the keeper of the lighthouse, who lives near, to report to him whenever the ledge is bared, and word is then sent to the Museum. Mr. Stokes' visits were in response to these calls. In both cases the wind changed before he arrived at the beach, although leaving Honolulu at once.

Botany. I am sorry to differ from the report of the Curator of Botany addressed to me, when he conveys the impression that not so much work has been done in his department as might have been, owing to adverse weather. I know that he has worked hard all the year, and I shall quote his statements of the journeys he made:

"Numerous short excursions were made into the forests of Oahu, the first extended trip being to the region about Palehua in the Waianae mountains. Four days were spent here and several rare plants obtained. I wish to thank Mr. H. M. von Holt for his kindness in extending to me the use of his mountain house at Palehua; and also Mr. Charles Lucas for kindly giving Dr. Cooke and myself permission to collect plants and shells in Niu valley.

"An excursion for the purpose of studying the vegetation of the island of Hawaii was made between June 10th and September 10th. A general base station was made at Mr. T. C. White's residence near Kailua, from which place the expedition started out. The Director considered that a guide was absolutely necessary for this trip, so a native Hawaiian, Charles Ka, was engaged. This man proved to know practically every inch of ground in Kona, and his aid in many things was a great help.

"The first extended camping trip started in at Puuwaawaa and extended through the mountains of Kona at an average elevation of 4500 feet and ended at Kapua. Stops of from two to ten days were made at each of the following places and the surrounding regions

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penetrated in all directions: Puuwaawaa, Hanehane, summit of Hualalai, Kaalapuuwale, Kanehaha, Pulehua, Camp X, summit of Mauna Loa, Papaloa, Papaloa Pupu Kikinini, Kukui o Pii, Honomalino and Kapua. From Kapua I returned to Kailua and left next day by steamer for Kau. My headquarters for this district was at the Kapapala ranch. The whole district was fairly well covered in daily trips from the ranch, only two short camping trips being necessary. Mauna Loa was ascended to about the 8000 feet elevation, the Kau desert was crossed in several places, one trip extending to the seven craters in Puna.

"From Kau I returned to Kailua, and went on to Waimea. The ditch trails in the Kohala mountains back of Waimea were visited, and also the slopes of Mauna Kea in the vicinity of Waikii. Mauna Kea was ascended to the 11;000 feet elevation. It had been my intention to go over a much larger proportion of this mountain, but a guide and animals were not obtainable without considerable expense, and as the latter were essential for transporting the collecting outfit this part of the program had to be postponed. Almost continuous rain in the Kohala mountains which continued for a month after my departure, made further exploration under such conditions a waste of time and I returned to Honolulu. About 450 varieties of plants were collected, and I believe I obtained a more comprehensive knowledge of the Hawaiian vegetation than on any previous trip.

"I wish to thank Mr. A. F. Judd, to whom I am indebted for many valuable suggestions and aid in arranging the trip; and also the following gentlemen of Hawaii, who aided me in every possible way, not only in giving permission to collect on their lands, but also extending information and help which added both to the value and pleasure of the trip: Thos. C. White, Allen Wall, Frank Greenwell, John Paris, John McGuire, Robert Hind, Julian Monserrat, Alfred W. Carter, J. McAllister, J. J. Jorgensen, Mr. Sproat and David Forbes.

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"Our exchanges with the three institutions mentioned in the last report have continued with satisfaction on both sides. The additions to the herbarium are shown in the list of accessions.

"The conveniences for arranging the herbarium have been greatly improved by the addition of new cases in the basement, formerly the Director's room. The arrangements for work or for showing specimens to visiting workers in botany are nearly perfect."

Pulmonata. I quote from the Curator's report to me:

"The year 1911 has been the most satisfactory, in the amount of work accomplished on our Hawaiian land shells, of any since the Curator has been connected with the staff of the Museum. For the first time the collection is really accessible for study. Before the occupancy of the laboratory the collection was stored in four different parts of the Museum. The trays were piled in cases and on the floor of one of the alcoves of the third floor of Hawaiian Hall, and a good deal of the material had to be kept at the home of the Curator for study during the greater part of the time. Now, with proper cases, shelves, work tables and a sink, the Curator can get at and has handy whatever specimens or apparatus he may need. Probably half again or twice as much work has been accomplished this year, due for the most part to the time saved in getting at whatever has been needed. The moving of the collection from different parts of the Museum, and the partial arrangement of the same have taken up a great deal of the Curator's time during the year.

"At present the genera *Philonesia*, *Endodonta*, *Mesopupa*, *Lyropupa*, *Amastra*, *Carelia*, *Leptachatina*, *Auriculella*, *Tornatellina*, *Succinea* and several other genera with from one to four species, are arranged in the cases. Our collection of the genera of *Auriculella*, *Carelia* and *Endodonta* is fully arranged and classified according to species and distribution, and at present only the labels have to be written and placed in the trays. This will necessitate the writing of about 1000 to 1500 labels.

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"A portion of the genera *Leptachatina*, *Nesopupa*, *Lyropupa* and *Amastra* are similarly worked out. About 10,000 lots remain to be worked up if we exclude the genus *Achatinella*, which contains from one-third to one-half the catalogue numbers of our collection. During the year the material of the Thwing collection, except *Laminella* and *Achatinella*, which probably contain nine-tenths of this valuable collection, has been catalogued and distributed in proper order. The catalogued material contains about 750 numbers and has something over 4000 specimens. Also the Gulick collection, presented to the Museum by the Curator, has been arranged according to genera, but has not been catalogued, owing to lack of time. To properly catalogue, arrange and label these two valuable collections will take probably a year, at least, of undivided time. During the year 1607 catalogue numbers, containing 18,682 shells, have been added to the collections; of these 12,649 specimens were collected in the field by the Curator.

"Two notable finds were made during the year: the first, a small collection of land and marine shells, probably presented to the Hawaiian Government, was found in one of the cases. These shells were undoubtedly labeled by Dr. Newcomb, as experts in handwriting have compared the labels with letters written by Dr. Newcomb to Andrew Garrett, which letters are in the Museum. This collection contains a number of Dr. Newcomb's species. The second find was in a large collection of more than 30,000 specimens of land and marine shells presented to the Museum by Mr. W. McInerny. This collection was made by Mr. H. M. Whitney, and given to Mr. McInerny by Miss Kelley. In this collection was found a large series of the very rare *Carelia cochlea* Pfr., and another series of *Leptachatina fossilis* Cooke, besides several fossil specimens of two or three new species of *Leptachatina* and *Helicina*, and a large series of *Achatinella* from Manoa and Tantalus, and specimens of several species of *Carelia*. Of *Carelia cochlea* the Museum had but eight specimens, one from the Ancey

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collection and seven from the Thwing collection. The new series showed several interesting variations in form, sculpture and color which have never been noted. Of *Leptachatina fossilis* the Museum did not possess a specimen. This species was only known from the single type specimen in the Academy of Natural Science in Philadelphia.

"During the year the Curator has started four series of card catalogues and has worked on them intermittently as time permitted. The first is a bibliographical catalogue arranged by authors, with lists of the new species described under each title. The second is a catalogue of the specific names of Hawaiian non-marine shells arranged alphabetically with a complete (if possible) list of references to each of the species. The third, arranged under each genus according to the catalogue numbers, is a series of notes on the specific characters of all the shells under each catalogue number. The fourth is a catalogue of the different localities with lists of the species reported from each, and list of the Museum catalogue numbers of shells found in each. The first and second catalogues are complete (so far as the Curator knows) from 1789 to 1843.

"During the year Mr. Andrew Garrett's drawings, notes, lists and letters have been labeled, indexed and arranged as far as possible. During the year Dr. Pilsbry has published two parts of his Manual of Conchology, dealing with our Amastrinæ. Types of several of his new species which were loaned to him by this Museum have been returned to our collection."

Casting and Modeling. Mr. J. W. Thompson has continued his work on the grand collection of Hawaiian fish casts, but has, especially lately, turned his skill to making casts of rare specimens in the Museum for exchange with other museums for similar casts of their treasures which cannot otherwise be obtained. Mr. Thompson's skill in painting these casts makes the result almost undistinguishable by sight from the original. I have never seen

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in foreign museums such good work in this line. I used to think that the late M. Brucciani of the British Museum was *facile princeps*, but after seeing Mr. Thompson's work I am compelled to revise my opinion. We have had rare specimens that the owners did not care to give to the Museum at present, loaned to us for this reproduction, of which an illustration is given in my note of a curved adz printed later in this report. It is hoped that the next report may announce the acquisition of a number of rare objects from other museums and private collections that will largely increase the value and interest of our collections for study and comparison. I place this line of Mr. Thompson's work next in importance to that of his fish casts. He has also prepared various zoological specimens for the Museum in the absence of any taxidermist. The care and rearrangement of our large ichthyological collection in spirits also fell to his charge, as we have no marine zoologist.

Administration. Certain changes in the administration have greatly conduced to an increased production in each department. When it was decided to open the Museum on five days in the week (reserving Wednesday for such work as cannot well be done if interrupted by visitors), and end the very annoying system of special permits to steamer passengers, the office of Superintendent of Exhibition Halls was established, and Mrs. Helen M. Helvie appointed to the post from October 1st. This appointment was a particularly happy one, and under Mrs. Helvie's care the halls have been kept in perfect order, and visitors greatly assisted; she has also had full control of the three janitors, thus relieving the rest of the staff from much interruption and waste of time.

As our Librarian, Miss E. B. Higgins has nearly settled the library in its new quarters; she has found time to take charge of the accounts, and of the exchanges and publications, matters hitherto making increasing claims on the time of our universal helper, the Curator of Polynesian Ethnology. This arrangement will give

ies and publications, matters hitherto making increasing claims on the time of our universal helper, the

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him much more time for original investigation for which he is well fitted, and his department (the largest in the Museum) will be greatly benefitted. Mr. Stokes has also arranged and labelled our excellent collection of Hawaiian corals, many of which he collected.

Attendance of Visitors. As the change in open days came into effect October 1st, the list of attendance is given in two parts of which the totals may easily be compared. For last year the number of whites was 5457; this year 6210. The number of visitors of all nationalities for the two years was 11,012 and 11,202.

TABLE OF ATTENDANCE.

1911.	Whites.	Hawaiians.	Portuguese.	Chinese.	Japanese.	Others.	Open on		Visitors on closed days.	Average Attendance.		Total Visitors.
							Public days.	Other days.		Public days.	Other days.	
January	460	80	50	37	60	23	9	3	41	75	17	710
February	606	80	27	114	118	1	9	2	5	105	3	946
March	596	103	49	84	107	21	9	5	49	101	10	960
April	439	148	64	96	127	16	9	4	31	95	8	890
May	433	68	32	54	164	11	8	3	52	89	17	762
June	343	55	60	71	173	13	10	6	23	69	4	715
July	534	120	64	134	136	17	9	5	53	106	11	1,005
August	527	79	55	78	104	16	8	5	109	94	22	859
September	597	86	80	99	174	41	11	4	163	83	41	1,077
Totals......	4,535	819	481	767	1,163	159	82	37	526	90.2	14.2	7,924
October	654	315	113	129	132	6	22			61		1,349
November	440	149	119	98	247	22	20			50		1,075
December	591	62	45	52	89	15	21			41		854
Totals......	1,685	526	277	279	468	43	63			52.		3,278

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List of Accessions.

ETHNOLOGICAL.

By Gift.

Mrs. W. R. Castle, Honolulu: (10,249–10,251)

Two paddles. Micronesia.

Fishing stick. Hawaiian Islands.

Estate of the late A. S. Cleghorn, to be known as "The Kaiulani Collection": (10,257–10,544)

Twenty-nine poi bowls, 3 meat dishes, 3 poi boards, finger bowl, 3 spittoons, olona board, bearing stick, 2 music sticks, 3 kahili handles, frame for mirror, 4 pillows, 14 sets of bed tapas, 3 tapa shawls, tapa loin-cloth, set tapa samples, tapa bundle, idol, dart, 10 tapa markers, 2 wands, 2 human hair necklaces, hook of coral, kukui-nut necklace, 2 olona scrapers, 3 Niihau mats, 4 lauhala mats, 5 tapa beaters, 2 kahili, knee drum, dip net, gourd water bottle, 9 feather lei, 3 tufts mamo feathers, surf-board, 8 fish-hooks, 8 poi pounders, mortar and pestle, stone lamp, stone dish for dye, 4 stone cups, stone mirror, 4 sling stones, 2 stone sinkers, 20 stone adzes, 2 stone gouges, 16 bowling stones, stone hammer, 5 polishers (of stone), stone clapper, canoe model, house model, 11 gourd, coconut and wooden bowls, stone idol, stone plummet, dish (of coral rock). Hawaiian Islands.

Two spears, fan. Samoa.

Two clubs, paddle, fly whisk, string of fish teeth, 2 shell rings, ivory and bead ornament, shell money, 2 bands braided grass. Southern Pacific.

Seven arrows, 2 spears. Solomon Islands.

Stone poi pounder. Caroline Islands.

Shell adze. Micronesia.

Mrs. C. M. Cooke, Honolulu: (10,255)

Ancient basket. Hawaiian Islands.

Dr. C. Montague Cooke, Honolulu: (10,256)

Bath rubber. Hawaiian Islands.

A. F. Judd, Honolulu: (11,015)

Cane covered with mat-work. Philippine Islands.

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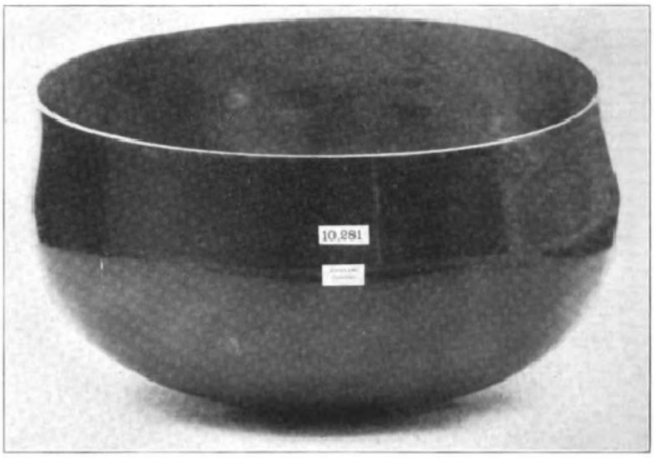


FIG. 1. POI BOWL FROM THE KAIULANI COLLECTION. DIAMETER 14 INCHES.



FIG. 2. MEAT DISH FROM THE KAIULANI COLLECTION. LENGTH 16 INCHES.

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FIG. 3. MEAT DISH FROM THE KAIULANI COLLECTION. LENGTH 29 INCHES.

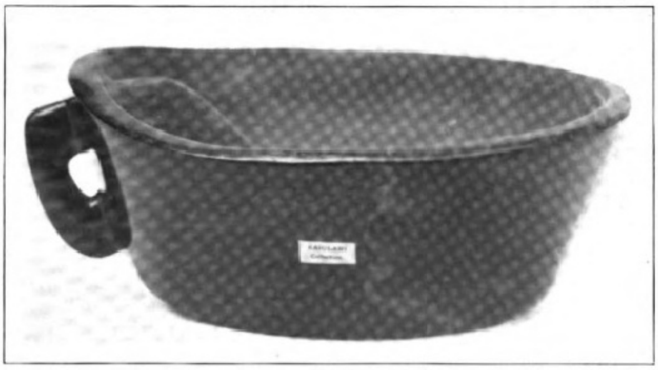


FIG. 4. FINGER BOWL FROM THE KAIULANI COLLECTION.



FIG. 5. SPITTOONS FROM THE KAIULANI COLLECTION.

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H. Kahaule, Koloa, Kauai: (11,014)
Stone kupua called Ka Huewai.

W. H. Rice, Jr., Lihue, Kauai: (10,519–10,520)
Two bowling stones. Kauai.

D. Thaanum, Hilo, Hawaii: (10,667)
Poi pounder, intermediate form. Kauai.

F. W. Thrum, Hilo, Hawaii: (11,012–11,013)
Mortar and pestle. Olaa, Hawaii.

Mrs. Emil Waterman, Honolulu: (10,560)
Poi pounder, intermediate form. Kauai.

A. K. Williams, Honolulu: (10,666)
Adze. Oahu.

By Exchange.

G. R. Carter, Honolulu: (10,557–10,559)
Two sprays of oo feathers, spray of iiwi feathers. Hawaiian Islands.

By Purchase.

Ukeke, tapa marker, 4 olona scrapers, polishing stone, 4 sling stones. Hawaiian Islands. (10,521–10,531)

Collection made by A. M. McBryde, Wahiawa, Kauai: (10,668–11,611)

Thirty-nine stone adzes, 8 polishing stones, 3 stone hammers, 3 sling stones, wooden club, stone club, 5 stone pestles, 19 poi pounders, 7 stone cups, 4 stone dishes, 19 stone lamps, 3 stone mortars, kukui-nut crusher, stone mirror, 18 bowling stones, squid hook, 8 sinkers, 5 shells for squid hooks, phallic stone, stone idol, 32 tapa beaters, tapa board (for malo), 20 tapa markers and rulers, 2 hula foot plates, 4 music sticks, 2 massage sticks (for abdomen), massage stick (for back), lua stick, wooden dagger (double-pointed), fire stick, 2 spears, 2 olona boards, 5 olona scrapers, 8 netting needles, 5 spacers, 26 fish-hooks, 5 olona fish lines, 4 human hair necklaces, ivory comb, tortoise-shell comb, 8 ivory beads, ivory and glass bead necklace, 4 feather lei, pipe, 4 dogs' teeth anklets, 2 Niihau mats, tapa shawl, 2 tapa dresses, 2 tapa waist-cloths, 3 sets bed tapas, potato bag, 10 knitted bags for poi bowls, shrimp

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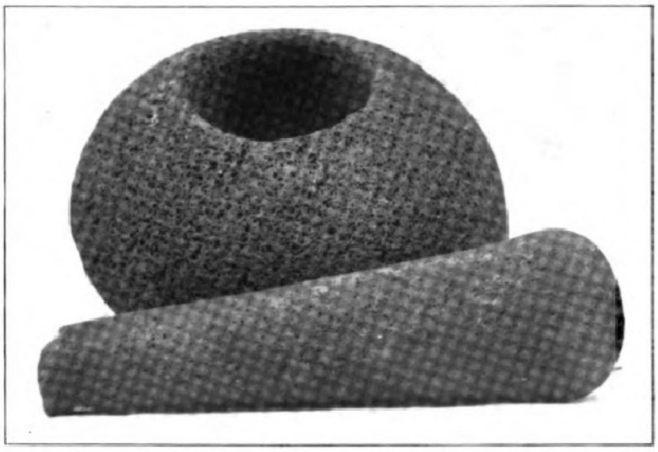


FIG. 6. PESTLE AND MORTAR FROM F. W. THRUM. LENGTH OF PESTLE, 13.5 INCHES.

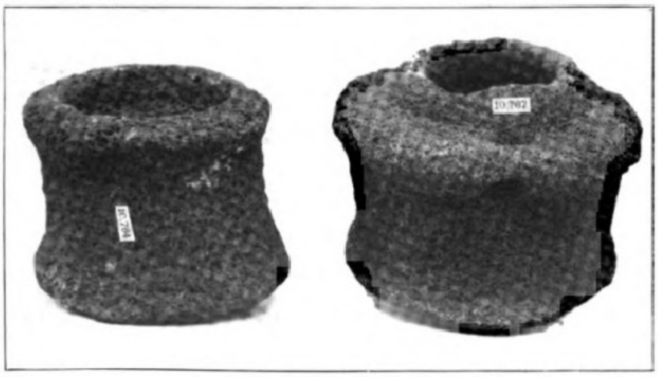


FIG. 7. STONE LAMPS FROM THE MCBRYDE COLLECTION.

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trap, shrimp basket, basket with cover, fish trap, 6 containers for lines and hooks, 3 water gourds, 3 gourd poi bowls, 2 gourd chests, gourd appliance for catching fish fry, 4 hula drums, gourd dish, gourd whistle, 2 tapa anvils. Hawaiian Islands.

Poi pounder. Marquesas Islands.

Two fish-hooks, pearl-shell ornament, pandanus mat, shell-money necklace, dress. Micronesia.

-hooks, 3 poi bowls. Hawaiian Islands. J. R. Myers, Kilauea, Kauai: (L549-550)

Collection made by W. C. Schiefer, Makaweli, Kauai: (10,561–10,665)

Forty adzes, stone knife, stone gouge, 10 stone pestles, 9 poi pounders, polishing stone, stone club, 2 stone mirrors, 4 sinkers, 2 mortars, 5 stone cups, sling stone, 2 stone hammers, adze handle, stone marble, 15 bowling stones, 3 tapa beaters, spittoon, wooden dagger, pipe, coconut spoon. Hawaiian Islands.

Wooden spoon. Alaska.

By Loan.

A. L. C. Atkinson, Honolulu: (L 475–477)

Three Hawaiian stone implements.

Francis Gay, Makaweli, Kauai: (L 547–548)

Two Hawaiian stone knives.

Miss Frances Johnson, Pearl City: (L 525)

Carved Marquesan bowl.

Paul Kahlbaum, Koloa, Kauai: (L 526–545)

Stone club head, sinker, stone cup, stone lamp, stone mirror, stone pestle, bowling stone, polishing stone, slingstone, 4 stone adzes, olona fish-line, 10 fish-hooks, 3 poi bowls. Hawaiian Islands.

J. R. Myers, Kilauea, Kauai: (L 549–550)

Stone adze, stone axe. Hawaiian Islands.

W. H. Rice, Sr., Lihue, Kauai: (L 478–524)

Adze handle, 11 stone adzes, 4 polishing stones, 4 bowling stones, 3 sinkers, 4 poi pounders, 4 sling stones, stone cup, stone mortar, stone idol, pearl-shell knife, paddle, poi bowl of Kuhaumoana, water-bottle of Keelikolani, poi bowl of ornamented gourd, pillow, human hair necklace, tapa mallet, set of bed tapa. Hawaiian Islands.

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Three tapas. Samoa.
Shell necklace. Micronesia.

S. W. Wilcox, Lihue, Kauai: (L 546)
Hawaiian stone adze, with arched cutting edge.

RELICS AND ECONOMICS.

By Gift.

J. W. Brogan, Honolulu: (10,532–10,536)
Five specimens of pottery made from Hawaiian clays.

Estate of the late A. S. Cleghorn, part of the Kaiulani Collection: (10,257–10,544)
Seven Hawaiian, 1 Japanese and 1 Servian decoration.
Two medals, Royal Hawaiian Agricultural Society, awarded to Princesses Likelike and Kaiulani.
Nine Hawaiian banners and flags belonging to Princesses Likelike and Kaiulani.
Bonnet of Princess Ruth.
Dress of Princess Kaiulani.
Key to first government vault.
Cannon ball, supposed to have been fired at Kealakeakua bay by one of Captain Cook's vessels.
Glove box belonging to Princess Likelike.
Dining table belonging to Hon. Abner Paki.
Two chairs belonging to Minister R. C. Wyllie.
Chair belonging to Kamehameha V.

Rev. W. D. Westervelt, Honolulu: (10,252–10,254)
Admiral's hat, sword and epaulettes, said to have belonged to Kapaakea.

BOTANICAL.

Merrill, Philippine plants (exchange)	300
Elmer, Philippine plants (purchase)	1,250
Maiden, Australian plants (exchange)	100
Herbarium Prince Roland Bonaparte (exchange)	109
C. M. Cooke, 94 packets Hawaiian Hepaticae, 2 Hawaiian plants	96
J. M. Lydgate, Hawaiian plants	14
J. J. Greene, fasciated Sapota	1
J. W. Thompson	2

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J. F. G. Stokes	3
F. H. Partridge, fasciated Codiaeum	1
G. P. Wilder, cultivated plant	1
V. S. Holt (U. S. Agricultural Station), peculiar ohia root	1
Curator's collection	2,549
Total additions to herbarium	4,428

CONCHOLOGICAL.

Collected or given by	Specimens	Lots
Curator of Pulmonata	12,649	612
I. Spalding	2,074	315
A. F. Judd	189	29
C. H. Cooke	16	4
R. von Holt	209	6
C. N. Forbes	324	29
L. Thurston	473	43
W. A. Bryan	132	2
T. A. Cooke	26	6
W. Emory	15	1
F. and E. Lyman and E. Rowold	116	29
D. Thaanum	449	75
F. B. Freitas	58	13
C. M. Cooke, Jr.	13	4
Uncatalogued material in Museum collected prior to 1911 from H. W. Henshaw, D. Thrum, R. Duncan, H. Meyer, D. D. Baldwin, A. H. Rice, R. A. Cooke (some of these are para- and metatypes)	1,939	439
Thwing collection (purchased)	4,370	263
Total	23,052	1,870

ADDITIONS TO THE LIBRARY.

The Kaiulani Collection. Bequest of the late A. S. Cleghorn.

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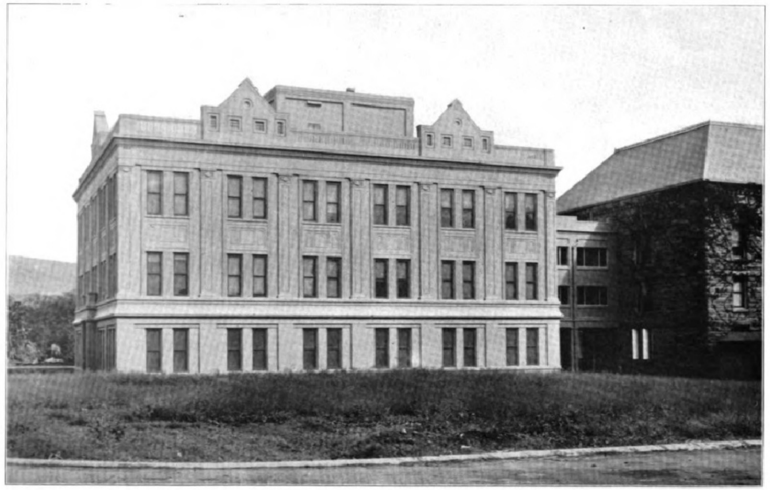


FIG. 8. THE NEW LABORATORY.

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The New Laboratory.

THE material selected was reinforced concrete. The contract was given to Lucas Brothers, and the architect was J. L. Young. The plans adopted were those of the Director, which were made several years before in connection with those of the Library and Papuan Hall. All of these had in view stone as a building material, with steel and concrete flooring, that, externally at least, they might conform to the buildings already finished. With the change of material the plans had to be altered with the changed conditions, and the alteration most to be regretted was the necessary change of floor level in the upper stories which do not conform to the levels of the galleries in Hawaiian Hall, to which the new structure is attached by concrete bridges at a distance of thirty feet. Those actively engaged in the construction of the building: W. von Wagner, foreman, whose untiring industry pushed forward as much as possible a work which was tedious in the extreme. For the architect, Mr. Albert J. Greene attended to the engineering matters of lining and leveling. The Hawaiian Electric Company put in the interior telephones and the electric wiring. The plumbing was done by E. W. Quinn, and the painting by S. Stephenson. The Honolulu Iron Works furnished the overhead trolley and hoists.

The accompanying views and plans will, it is hoped, make the following general description intelligible. The building is 80×66 feet: each floor has a hall 10 feet wide extending its length. On the ground floor, which is at the level of that of Hawaiian Hall and consequently slightly below the surface of the rising ground at the back of the Museum site, on the left of the entrance

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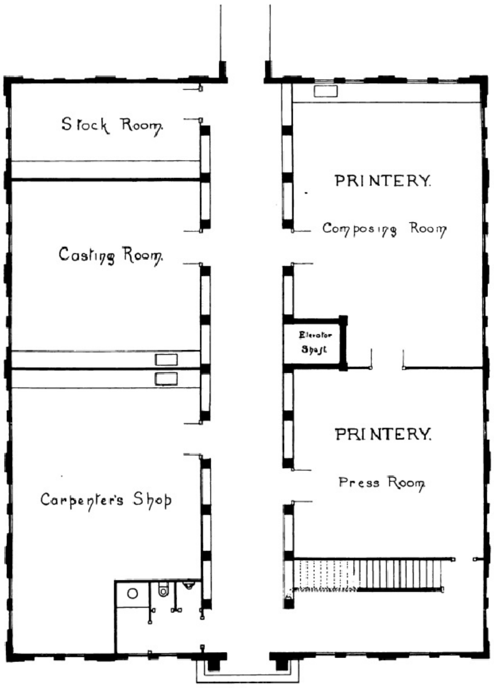


FIG. 9. GROUND FLOOR.

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is the Printery, 25.5×65 feet, lighted by fourteen windows, and divided into Composing room and Press room, occupying the whole length of the building as far as the stairway. On the opposite side of the hallway is first, the Paper Stock room, 25.5×13 feet, the two windows protected by shutters; next, the Casting room, 25.5×25.5 feet, where the casts of fish, fruit or other objects are made and painted; then the Machine shop, a fine, light room with work benches, turning lathe and other work shop appliances; and at the end of the hall is a convenient shower bath and lavatory. Opposite this is the stairway to the next floor.

Reversing our direction we have on the left the Anthropological room with scales and apparatus for anthropometry, cases for human skeletons and crania, and convenient work benches; this corner room is 25.5×12.5 feet. The Entomological room follows, of the same size, and then the Ornithological room, 25.5×25.5 feet, where the great collection of Hawaiian bird skins is to be stored for preservation and study when suitable cases are provided. The remaining room on this floor is the Director's office, 25.5×26 feet, where are stored the letter files, card catalogues of specimens, illustrations used in publications, etc.; here also is the town telephone, and as each room in the Museum is furnished with internal telephonic communication connection can be made for all the workers in the various buildings. Opposite the Director's room is the room for Taxidermy, 25.5×38.5 feet, extending into the upper floor, and at present occupied as the temporary Library; and beyond this is the Publication room, 25.5×26 feet, where the printed matter from the press below is stored and from which it is mailed to exchanges and subscribers. The two floors of the Taxidermy room are connected by a spiral iron stairway.

The third floor is appropriated as follows: over the Director's room is that occupied by the Curator of Ethnology, 25.5×26 feet, fitted with every convenience of cupboard, racks, trays and shelves. Here the specimens are examined, catalogued and assigned to

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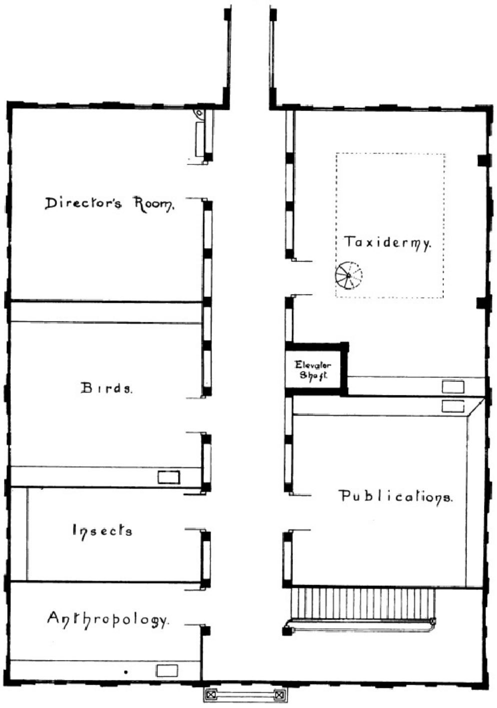


FIG. 10. SECOND FLOOR.

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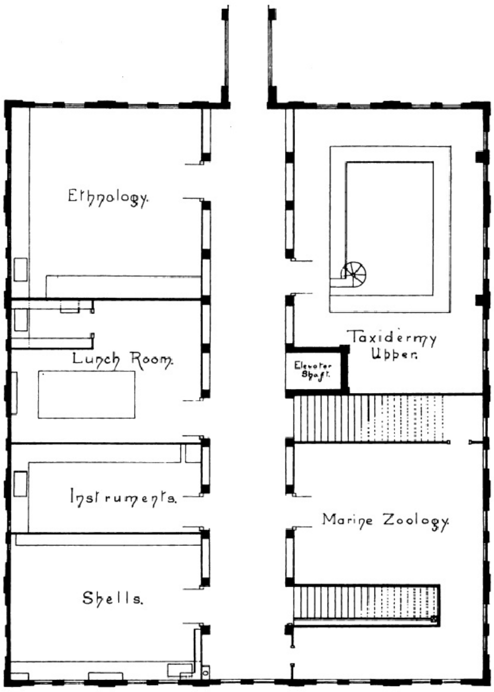


FIG. 11. THIRD FLOOR.

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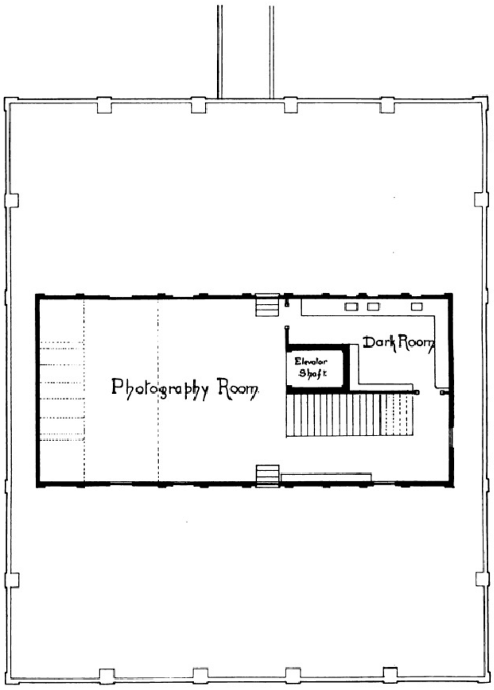


FIG. 12. ROOF AND PHOTOGRAPHIC DEPARTMENT.

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their positions in exhibition cases or with the duplicates for exchange or the reserve for study. Next comes the Lunch room, 25.5×19 feet, a great convenience, as the members of the staff live miles away from the Museum. Next in order is the Instrument room, 25.5×12.5 feet, where are kept the phonograph and its records, testing machines, electro-photo-micrographic camera, X-ray apparatus, and many other appliances used in examinations or researches. The corner room, 25.5×19 feet, is devoted to the Curator of Pulmonata, and here are the best known appliances for cleaning, cataloguing and storing our vast collections of Hawaiian land shells, and also for studying the builder of the shell as well. Other pages of this report will show what extensive use the Curator makes of this. Across the hallway is the large room set aside for Marine Zoology, and from the middle of the hallway a flight of stairs leads up to the roof level, a third of which is occupied by the Photographic department, 24.5×55.5 feet. The most comfortable Dark room that has been devised for a hot climate is provided with earthen sinks, a tank for washing bromide prints, three windows with orange and ruby sashes, convenient apparatus for enlarging, electric printer, ventilators passing a sufficient air current through the room, and the other usual appliances of these work rooms. The Light room has a supply of cameras, backgrounds and stands and racks for the quick adjustment of objects to be photographed. The lighting is all that could be desired, and the ventilation is provided by suitable openings in the top of the walls and by two doors opening onto the roof. As nearly all the staff are expert photographers and a great deal of photographic work is done both for record and for illustration of publications, this room and its equipment are very important adjuncts to the laboratory.

White cedar cases with glass doors line all the hallways; a portion of the lower hall is occupied by the collection of Hawaiian and South-east Pacific fishes in alcohol, many types among them.

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A hoist works from the ground floor to the Photographic department. A cistern on the upper roof supplies automatically the photographic sinks in case of temporary interruption of the main water supply.

Work of construction commenced early in January, 1910. The soil was removed to the suitable level and parallel lines of terracotta drain pipe laid through this area; the excavation for the wall and pillar foundations being carried down to the bedrock. In one place the soil proved to be decomposed lava that had later been permeated by sulphurous gases whose action on the calcareous portion of the earth had formed beautiful crystals of gypsum in abundance, of tolerably uniform size and frequently twinned. Otherwise the soil did not differ from that of the rest of the yard.

Waterproof material was carefully spread over the leveled surface and the concrete floor poured on this. The rotary mixer and the hoist were actuated by internal combustion engines. The greatest care was taken to have the ground floor free from dampness by external as well as the internal subsoil drains mentioned, quite independent of the drainage system of the building. So far this has proved satisfactory. That the other floors might be solid work was continued through the night that the pouring might be continuous.

The Kahn system of reinforcing was used, and a thicket of steel rods, wired together, rose from the box moulds as the building progressed. Much of this may be seen in the illustrations showing the progress of the work. The floors and partitions were strengthened by expanded metal, and the concrete beams had suitable steel skeletons to take the stress. The stairways also were concrete, and indeed the whole building was monolithic. The plans of the floors and the views given with this brief account will make the structure intelligible.

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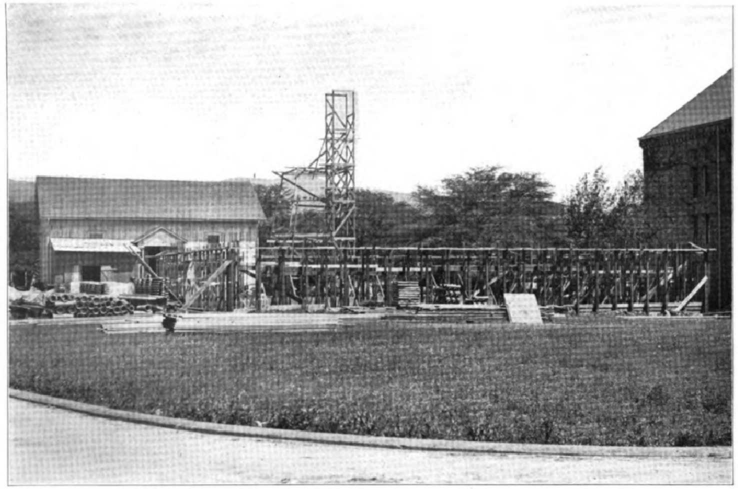


FIG. 13. FROM NORTHWEST. GROUND FLOOR COMPLETE; SETTING FORMS FOR FIRST STORY.

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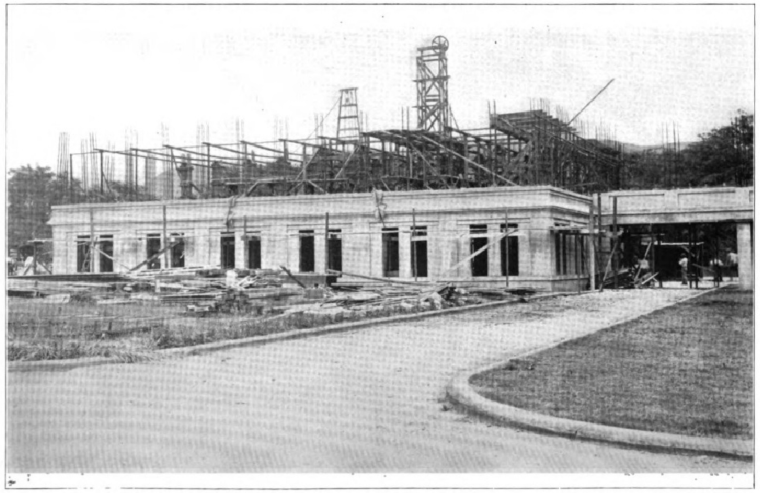


FIG. 14. FROM SOUTHWEST. FIRST STORY COMPLETE; SETTING FORMS FOR SECOND STORY.

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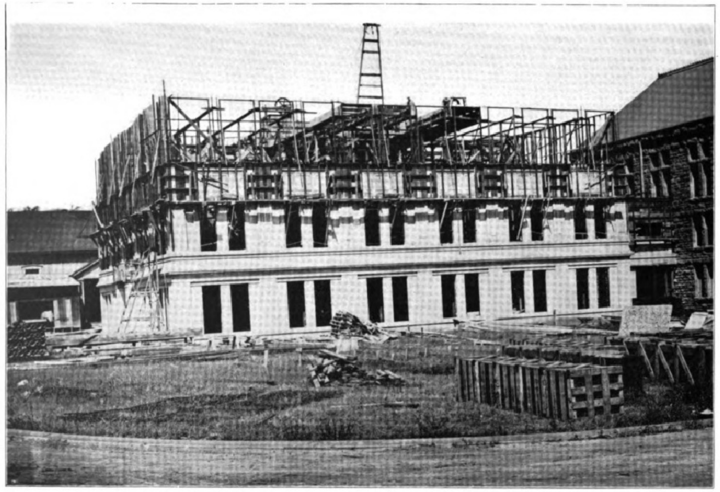


FIG. 15. FROM NORTHWEST. SECOND STORY COMPLETE; MOVING UP FORMS FOR THIRD STORY.

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FIG. 16. FROM NORTHWEST. THIRD STORY AND PHOTOGRAPHY ROOM COMPLETE.

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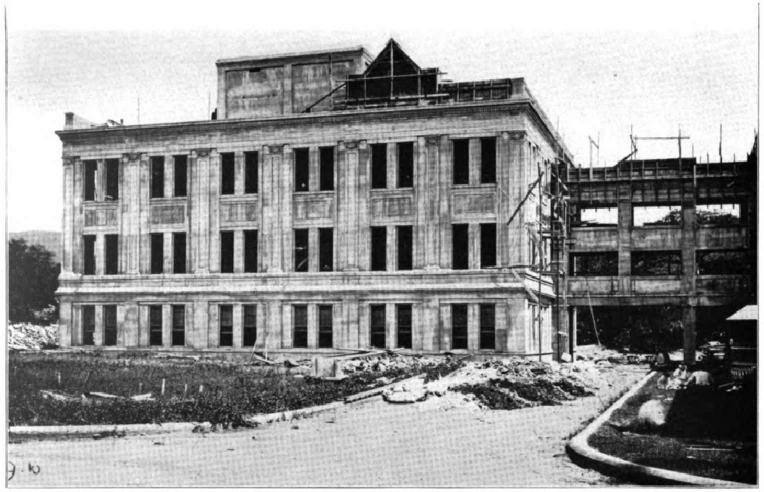


FIG. 17. FROM SOUTHWEST. SETTING BALUSTRADE ON ROOF.

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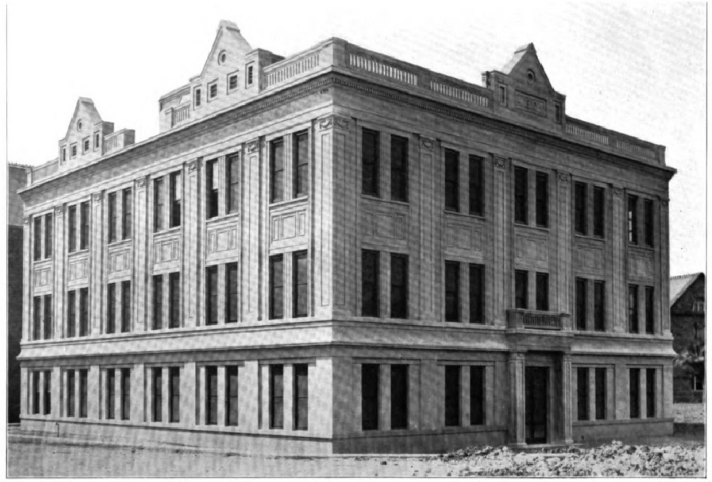


FIG. 18. BUILDING COMPLETED. FROM THE NORTHEAST.

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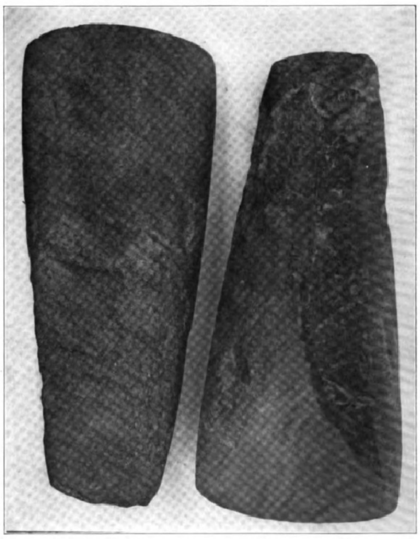
Another Curved Adze.

By William T. Brigham.

On page 255 of the last volume of Occasional Papers I described with figures a fine specimen of the rarely found curved adze. Another has been brought to my notice which is in the collection of Hon. G. N. Wilcox of Lihue, Kauai. This has been kindly loaned for casting and study, and the result of the casting with Mr. Thompson's skill is seen in the illustration; the replica is side by side with the original. The material is a greenish, banded, heavy stone of the general appearance of greenstone, or a lava partly metamorphosed into serpentine. In places fracture is dark gray, but not everywhere. It was found by Mr. Wilcox in 1874 at Waialua, Kauai, among the human bones common in the sand hills near the beach, so that it has been exposed more or less to the salt spray for the many years it has probably lain there by the mortal remains of its former owner.

This adze is much smaller than the one formerly described, but was probably used for the same purpose—rounding the inner bottom of a canoe, and when we consider how extensive the use must have been in the prominent industry of canoe building, one of the early visitors to Hawaii reporting 4000 canoes in and near Kealakeakua Bay, it is remarkable that so few of the curved form appear in collections, while stone gouges are not uncommon, and these are but small unhandled adzes. The weight is 24.2 oz.; the length, 7 in.; breadth of cutting end, 3 in.; length of cutting edge, 3.2 in. Fig. 19.

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Original. Cast, Reversed.

FIG. 19. CURVED ADZE FROM KAUAI.

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OCCASIONAL PAPERS

OF THE

BERNICE PAUAHI BISHOP MUSEUM OF POLYNESIAN ETHNOLOGY AND NATURAL HISTORY

Vol. V.—No. 3.

Notes on the Flora of Kahoolawe and Molokini.

An Enumeration of Niihau Plants.

BY CHARLES N. FORBES.

HONOLULU, H. I.
Bishop Museum Press.
1913.

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Notes on the Flora of Kahoolawe and Molokini.

BY CHARLES N. FORBES.

APRIL, 1913.

DURING the time between February 25 and March 10, 1913, I had the pleasure of accompanying an expedition[1] to Kahoolawe and Molokini, two of the smaller islands of the main Hawaiian group, and probably the least known botanically. Kahoolawe lies six miles southeast of Maui, the island of Molokini being about midway between. It is dome-shaped and has an area of forty-four square miles. There is a central hill 1472 feet high, and two small craters a distance of a mile or more on either side. These craters during wet periods serve as natural reservoirs, the pool in the southern one often remaining for three months. The eastern and southern slopes of the island are steep but gradual, and are cut by many ravines some of which are quite deep. These slopes for the most part are rough with lava boulders. The remaining coast line is a steep sea cliff, nearly vertical in places, and has an elevation of about 900 feet in the highest place. On the top there is a large sloping plain of red earth swept smooth by the prevailing winds. Mound-like hillocks, protected by pili grass (*Heteropogon contortus*), clearly indicate that at least eight feet of earth, and probably more, has been blown off the top of the island. Much of this material settles amongst the rocks on the lower slopes forming small fertile areas, but a large quantity is blown out to sea.

As a collecting ground for plants Kahoolawe has little to offer, but to any one interested in the many factors at work changing the character of an indigenous flora there is much of interest. To within recent times this island has been overstocked with various sorts of domestic animals and wild goats. The present lessee has done all that is possible to diminish the number of goats, and the

[1] The members of the expedition consisted of Mr. J. F. G. Stokes, Dr. C. M. Cooke and C. N. Forbes, of the Museum staff; Dr. H. A. Pilsbry of the Philadelphia Academy of Sciences, Mr. Ebenezer P. Low, lessee of the island, and Rev. Henry P. Judd of Kahului, Maui.

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small flock of sheep (now reduced to about 300) is to be rapidly disposed of. During a recent long period of unusually dry years these comparatively small flocks have been able to prevent any new vegetation from gaining a hold, and have also greatly retarded the growth of the few trees that there are. Goats cause considerable harm by girdling the keawe *(Prosopis juliflora)*, a tree introduced here about fifteen years ago and spread by horses and mules.

The prevailing shrub on the island is tree tobacco *(Nicotiana glauca)*, a naturalized plant, not now very common on the other islands. It grows quite plentifully on the rocky slopes and on the sides of the craters, in fact nearly everywhere except on the barren, wind-swept regions, and owes its existence to the fact that it is very rarely if ever touched by animals. The southern and eastern slopes are fairly well covered with (at this season) dried up pili grass *(Heteropogon contortus)*. In the mouths of the gulches are to be found small groves of keawe *(Prosopis juliflora)* which are slowly extending upward.

A few wiliwili trees *(Erythrina monosperma)* occurring here and there, mainly on the sides of gulches, are the sole survivals of what native forest might have existed on the island in former times. Old visitors to the island inform me that within the last twenty-five years at least they have seen the following shrubs on the island: puu keawe *(Cyathodes Tameiameiae)*, aalii *(Dodonaea viscosa)*, akoko *(Euphorbia multiformis* var.[2]), ohe *(Reynoldsia sandwicensis)*, and naio *(Myoporum sandwicense)*. The native names were given, the names in parentheses being my own substitution. From this I should judge that *Santalum ellipticum*, several varieties of *Wikstroemia*, *Pandanus odoratissimus*, perhaps scrub varieties of *Metrosideros polymorpha* and other dry land plants occurring at low elevations, must have been plentiful at one time. *Neraudia kahoolawensis*, recorded by Hillebrand[3] as the only specialty from the island, was not observed by any member of the party. In former times dry land taro, sweet potatoes and bananas were cultivated on the island, according to an old native.

[2] During a second visit Mr. Stokes has since collected two small specimens of *E. multiformis* at Kaunapou Bay.

[3] Hillebrand, W. Flora of the Hawaiian Islands. pp. 416.

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On account of the unusually long period of drought the number of plants observed was very small, and the specimens collected of poor quality. Mr. Low, the lessee of the island, informs me that after heavy rains many annual grasses and weeds spring up, so perhaps the complete number of plants of the island should be three or more times what is given below. However, any one familiar with Hawaiian vegetation should gain a fairly good idea of the flora from the following list of plants actually observed. As far as possible I have tried to use the latest accepted name for the plants in the enumeration, but have sometimes failed for lack of proper references. Where different I have given the name used in Hillebrand's Flora in italic.

FILICES.

Doryopteris decipiens (Hk.) J. Sm.
Pteris decipiens Hook.

Rather rare, growing under ledges and in the shade of rocks.

GRAMINEAE.

Cenchrus echinatus L.
Cynodon dactylon Pers.
Heteropogon contortus Roem & Sch.

The most abundant plant on the island.

AMARYLLIDACEAE.

Agave americana L.

About seven plants observed, which were probably planted at some time.

CHENOPODIACEAE.

Chenopodium sp.

Seedlings, material not sufficient for determination.

NYCTAGINACEAE.

Boerhavia diffusa L.

Not uncommon in various parts of the island, its somewhat enlarged roots probably aiding it to withstand the drought.

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PORTULACACEAE.

Portulaca lutea Sol.
Portulaca sclerocarpa Gray.

This plant is mentioned by Hillebrand as being collected by Lydgate on the island.

PAPAVERACEAE.

Argemone mexicana L.

Three plants were observed on the eastern pali.

CAPPARIDACEAE.

Capparis sandwichiana DC.

Occurs in a few places on low cliffs of the west side.

LEGUMINOSAE.

Acacia Farnesiana Willd.

Not common.

Erythrina monosperma Gaud.

The sole remaining indigenous tree.

Meibomia triflora (L.) Ktz.
Desmodium triflorum DC.
Mimosa pudica L.
Prosopis juliflora DC.

Small groves at the mouths of gullies. Introduced about fifteen years ago, and spread by horses and mules. The pods are one of the most important live stock foods on these islands.

Another unidentified leguminous plant was also collected.

ZYGOPHYLLACEAE.

Tribulus cistoides L.

EUPHORBIACEAE.

Euphorbia pilulifera L.
Euphorbia thymifolia L.

STERCULIACEAE.

Waltheria americana L.

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MALVACEAE.

Abutilon incanum G. Don.
Gossypium tomentosum Nutt.

There is a small area of this plant on the southwest side near the shore.

CACTACEAE.

Opuntia tuna Mill.

Perhaps a dozen plants seen on the island.

CONVOLVULACEAE.

Ipomoea palmata Forsk.
Ipomoea pentaphylla Roem & Sch., var. *trichosperma*.

This plant, which has large tuberous roots, is said to be quite conspicuous after the rains.

Ipomoea pentaphylla Jack.
Ipomoea pes-caprae (L.) Sw.

A few seedlings of this species were observed on a sandy beach.

VERBENACEAE.

Lantana camara L.

A few plants were observed by Mr. Stokes.

SOLANACEAE.

Lycium sandwicense Gray.

A few specimens amongst rocks near the shore.

Nicotiana glauca R. Grah.

The prevailing shrub on the island.

COMPOSITAE.

Acanthospermum brasilum Schrank.
Sonchus oleraceus L.

On hillocks of the wind-swept plain there is another composite not yet identified. This species also occurs on Maui.

There is a striking lack of shore plants; these salty individuals which usually escape goats and sheep on the other islands are completely consumed here, at least during the recent long drought.

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Much drift material is washed on the shores of bays on the north and east coasts, presumably from Maui, although one box bore a label from Kailua, Hawaii. The following seeds and fruits were picked up on the beach:

Acacia Farnesiana Willd.
Pods containing seeds capable of germination.

Aleurites moluccana Willd.
Many nuts seen, none found capable of germination.

Calophyllum inophyllum L.
Ipomoea.
Three species, all capable of germination.

Mangifera indica L.
Various sized fruits, incapable of germination.

Nicotiana glauca R. Grah.
Capsule containing seeds, perhaps washed or blown down from the cliffs above.

Mucuna gigantea DC.
Seeds capable of germination.

Pandanus odoratissimus L.
Keys rather numerous.

Terminalia catappa L.
Capable of germination.

Xanthium strumarium L., var. **echinatum.**
Several much worn capsules, none containing seeds.

Three undetermined seeds, perhaps capable of germination, and a fresh stem of *Plumieria*.

Ipomoea pes-caprae was the only plant seen growing on the beach which could be said to be derived from any of these stranded seeds. Most new arrivals are brought to the islands by other means. Many birds, as larks, minas, pigeons, plover, and various sea birds were observed at various times in different localities over

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the island. Mr. Maiki, the caretaker, tells me that with his son he has shot many pigeons which had corn in their crops, and hence, probably had flown across the channel from Kula, Maui.

Under a more favorable period of weather conditions *Nicotiana glauca* and *Prosopis juliflora* are probably the only two woody plants whose spread could be noticed. The former will eventually spread over a much greater area than at present, especially on the rocky slopes. *Prosopis juliflora* will spread up the gulches, provided there are horses or mules to carry the seed during the fruiting season.

MOLOKINI is a small crescent-shaped island lying midway in the channel between Maui and Kahoolawe. It is the eroded remnant of an old tufa cone, somewhat comparable to Koko crater on Oahu. The greatest elevation is 160 feet, the length along the ridge being about 1000 feet. The inner slopes of the crescent have an angle of 32.25 degrees, the outer edge being a nearly vertical cliff of 73.30 degrees. The only flat area consists of a small space about twelve feet wide and fifteen feet long.

Since 1911 an intermittent flashlight has been established on the island. There is no place where floating seeds could by any means become established, and all plants must be carried to the island by other means. Land birds occasionally visit the island, one member of the expedition observing a lark. The following plants were observed. All are what one might expect to find in such a locality. They form a fairly good vegetable covering over the island.

FILICES.

Doryopteris decipiens (Hk.) J. Sm.
Pteris decipiens Hook.

GRAMINEAE.

Heteropogon contortus Roem & Sch.

CYPERACEAE.

Cyperus, sp.

NYCTAGINACEAE.

Boerhavia diffusa L.

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PORTULACACEAE.

Portulaca lutea Sol.
Portulaca oleracea L.
Portulaca sclerocarpa Gray.

LEGUMINOSAE.

Meibomia uncinata (Jacq.) Ktz.
Desmodium uncinatum DC.

ZYGOPHYLLACEAE.

Tribulus cistoides L.

MALVACEAE.

Sida fallax Walp.

STERCULIACEAE.

Waltheria americana L.

CONVOLVULACEAE.

Jacquemontia sandwicensis Gray.

VERBENACEAE.

Lantana camara L.

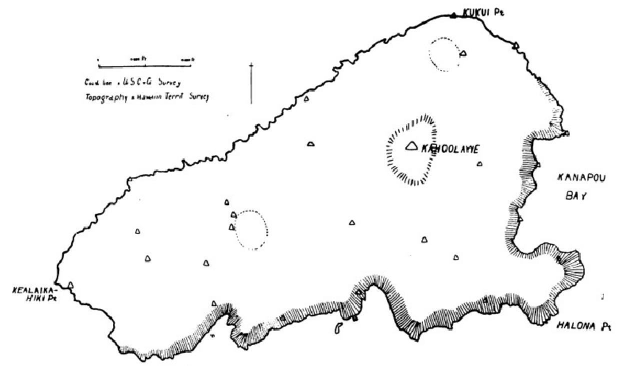
SOLANACEAE.

Lycium sandwicense Gray.

COMPOSITAE.

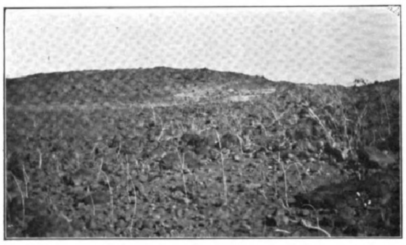
Lipochaeta lavarum (Gaud.) DC.

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1. Map of Kahoolawe compiled from Government survey. The craters are added in their approximate positions, and the cliff outline has been changed to conform with field notes taken on the island.

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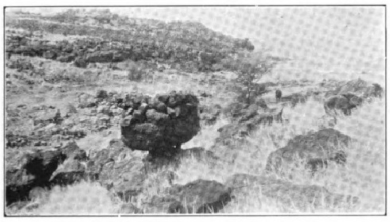
2. Inside slopes of north crater showing growth of tree tobacco (*Nicotiana glauca*).



3. Unique example of erosion on the barren wind-swept plains of the uplands. The ring of stones is the bottom of a former imu or underground baking oven of the old natives.

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4. Lower slopes, showing growth of pili grass (*Heteropogon contortus*) and keawe (*Prosopis juliflora*) in the mouth of a gully.



5. Landing at Kahoolawe, showing pili grass on the lower slopes and a few plants of keawe and *Opuntia tuna*.

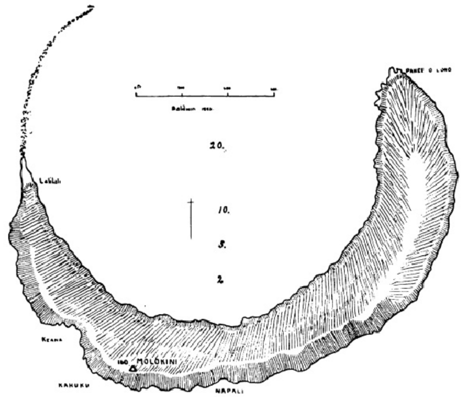
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6. Beach at Kanapou Bay where much wreckage and many plant seeds are washed ashore. View also shows the high cliffs which are characteristic of this portion of the island, and which are practically barren of vegetation.

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7. Map of Molokini from survey by Baldwin.

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An Enumeration of Niihau Plants.

By Charles N. Forbes.

April, 1913.

So LITTLE is known about the flora of the island of Niihau that it was thought that an enumeration of the plants known to occur there might be of some interest. As far as known Lay and Collie sometime between 1826 and 1827, Jules Remy between 1851 and 1855, and Dr. Wm. T. Brigham in 1865, are the only botanists who have visited this island. The only record of these collections is the mention of a few peculiar indigenous species in Mann's Enumeration, and in Hillebrand's Flora;[1] and it is doubtful if many of the commoner introduced species were collected.

During the month of January, 1912, Mr. J. F. G. Stokes of this Museum had the rare privilege of visiting the island, and most of the plants in the following enumeration are based on his collection. A few weeks later Mr. Stokes' native guide, Mr. Kalua Keale, made a collection from the only small area which they had not previously visited, so the list is probably fairly complete for the island. Plants not observed by Mr. Stokes have probably become extinct, or at least very rare.

Niihau is an irregularly shaped island lying 15 miles west of Kauai, and has an area of 73 square miles, with an elevation of 1304 feet for its highest point. About one-third consists of volcanic table land, this being surrounded on all but the eastern side by a low rolling plain composed of both volcanic and coral rock.

The northern end is a low plain of volcanic material, fringed in the proximity of the sea with dunes of coral sand. Where these two soils meet the herbage has a brighter hue, which Mr. Stokes considers as due to an improved condition of the lava soil from the addition of lime.[2] Along the eastern coast, to the south of Kii, dunes

[1] H. Mann, Enumeration of Hawaiian Plants, Proc. American Acad., July, 1867. W. Hillebrand, Flora of the Hawaiian Islands, 1888. I have not had access to a copy of Hooker and Arnott Botany of Capt. Beechey's Voyage of the Blossom, in which Lay and Collie's collection is described.

[2] I have not had the opportunity to investigate this, but would consider that it was probably due to there being more available moisture in the soil at this particular locality.

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have in places dammed up the surface drainage. On the same coast, north of Poleho, the sand has blown inland for about half a mile.

The plateau is also of volcanic material. The highest points are on the northern and northeastern boundaries, where the vertical cliffs reach 1304 feet at Paniau. From here the ground slopes downward to the south and west on a somewhat even grade, interrupted by several deep gorges, and by the high and prominent cone of Kaeo. The cliffs on the south are about 20 feet high. Kaali, the north cliff of the plateau, is rather moist, and there is a small spring at about the 800 foot elevation which is utilized as a water supply for the lowlands. It was here that Mr. Stokes collected most of his plants. The cliffs on the east were very dry and barren, there being a sparse growth of shrubbery on the talus slope, however.

Between the west coast and the plateau there is a low cliff of lime sandstone. The plain south of the plateau is composed of coral sand and sandstone, with an undulating volcanic belt near and parallel to the west coast. It has a low elevation and is frequently under water. Sand dunes and coral sandstone follow around the east and west coasts of this part. The southern point of the island consists of an eroded volcanic cone, reaching a height of 600 feet, which viewed from the southern end of the plateau over the low plain has the appearance of another island.

There are periods of very little rainfall, and the conditions affecting the flora are somewhat analogous to those of Kahoolawe described in another paper. Most of the available land is now used as pasturage for sheep and horses, as it has been for a great many years. The island was formerly overrun with goats, but these have been completely exterminated within recent years. Mr. Stokes reported that most of the island, especially on the top, was covered with Manienie (*Cynodon dactylon* Pers.). Near the southern end there are swamp-like areas where various species of *cyperus* occur, including *C. laevigatus*, from which the old natives made their famous mats. Most of Mr. Stokes' specimens were collected at Kaali on the western cliffs of the tableland, a few on the valley sides, and an interesting *Euphorbia* of the *Multiformis* group near the beach. This latter plant differs so strikingly from other members of the group that I have proposed it as a new species.

The flora of Niihau, like that of all the islands, has undergone great changes since the first botanist visited the group,

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changes which are the direct result of man's industry and civilization. When Dr. Brigham first visited the island there was a fair covering of native scrub plants over the greater part of the top of the island. Old inhabitants report a considerable area of bastard sandalwood (*Myoporum sandwicense* (A. DC.) A. Gray), the trees being perhaps twenty feet high. Now only a few sticks of dead wood and roots remain to prove the truth of these statements. At that time a small patch of Manienie (*Cynodon dactylon* Pers.) was being tended with considerable care in the yard of the Sinclairs. Now this grass forms the main pasturage for the valuable flock of sheep. The areas of *Cyperus laevigatus* which used to be tended with some care are being crowded out by another species, as well as by sheep, except where Mr. Robinson has protected it by fencing as of historical interest. A great many of the plants which could have been collected by Lay and Collie probably do not occur on the island at the present time, while the number of naturalized plants has probably increased in as great or greater proportion.

Of the plants in the following list, 25 are peculiar to the Hawaiian group; 39 are indigenous to the group but also occur elsewhere; 10 may be considered of aboriginal introduction to the group; 37 were introduced and naturalized prior to 1886, and 4 have become naturalized since 1886.

Schiedea amplexicaulis and *Euphorbia Stokesii* are probably peculiar to Niihau, but may be expected to occur on Kauai. Of the naturalized plants many have probably arrived on Niihau within comparatively recent years, as, for instance, *Batis maritima*, which prior to 1886 was only known from a small area near Honolulu, has now spread all over the group.

As I have not had the privilege of visiting Niihau, I wish to thank Dr. Brigham and Mr. Stokes for information concerning the physical features and floral aspects of the island, and for help in correcting the proof.

FILICALES.

Adiantum capillus veneris L.
Ceropteris calomelanus (L.) Und.
Dryopteris, sp.

Sterile fronds only; probably *D. truncata* (Poir.) O. Ktz.

Nephrolepis exaltata (L.) Schott.

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LYCOPODIALES.

Psilotum nudum (L.) Griesb.
Psilotum triqetrum Sw.

PANDANACEAE.

Pandanus tectorius Sol.
Pandanus odoratissimus L.

One tree observed by Mr. Stokes.

GRAMINEAE.

Capriola dactylon (L.) Ktz.
Cynodon dactylon Pers.
Heteropogon contortus (L.) Beuv.
Chaetochloa verticillata (L.) Scribn.
Panicum Beecheyi Hk. & Arn.

Said to have been collected by Lay and Collie. Not in the Bishop Museum herbarium.

Panicum nephelophilum Gaud., var. *xerophylum?*
Panicum pruriens Trin.
Sporobolus virginicus (L.) Kunth.
Saccharum officinarum L.

Dr. Brigham remembers seeing the native sugar cane growing in coral caves on the lowlands. It was not observed by Mr. Stokes.

CYPERACEAE.

Cyperus caricifolius Hk. & Arn.
Cyperus cymosa R. Br.

These two species were collected by Lay and Collie. There are no authentic specimens in the Museum herbarium.

Cyperus laevigatus L.
Cyperus pennatus Lam.
Cyperus, sp.

Only leaves collected.

Cyperus trachysanthus Hk. & Arn.
Cyperus polystachys Rottb.
Scirpus lacustris L.

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PALMACEAE.

Cocos nucifera L.

Observed by Mr. Stokes, but not collected.

DIOSCOREACEAE.

Dioscorea sativa L.

PIPERACEAE.

Peperomia, sp.

BATIDACEAE.

Batis maritima L.

MORACEAE.

Artocarpus incisa Forst.
Broussonetia papyrifera Vent.

CHENOPODIACEAE.

Chenopodium album L.
Chenopodium sandwicheum Moq.

AMARANTACEAE.

Nototrichium sandwicense (A. Gray) Hillebr.

NYCTAGINACEAE.

Boerhavia diffusa L.
Boerhavia tetrandra Forst.

FICOIDEAE.

Sesuvium portulacastrum L.

CAROPHYLLACEAE.

Schiedea amplexicaulis Mann.

Collected by Remy: not in the Museum herbarium.

MENISPERMACEAE.

Cocculus Ferrandianus Gaud.

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LAURACEAE.

Cassytha filiformis L.

PAPAVERACEAE.

Argemone mexicana L.

CRUCIFERAE.

Coronopus didymus (L.) J. E. Smith.

CAPPARIDACEAE.

Capparis sandwichiana DC.
Cleome sandwicensis Gray.

Recorded in Mann's Flora;[3] not observed by Mr. Stokes.

LEGUMINOSAE.

Abrus precatorius L.
Acacia Farnesiana Willd.

Observed but not collected by Mr. Stokes.

Caesalpinia bonducella (L.) Flem.
Canavalia galeata Gaud., var. *pubescens* Hk. & Arn.
Cassia occidentalis L.
Erythrina monosperma Gaud.
Indigofera anil L.
Meibomia triflora (L.) Ktz.
Desmodium triflorum DC.
Meibomia uncinata (Jacq.) Ktz.
Desmodium uncinatum DC.
Prosopis juliflora DC.
Sophora tomentosa Hk. & Arn.

Not in collection.

Sesbania grandiflora (L.) Pers.
Cracca purpurea L.
Tephrosia piscatoria Pers.

OXALIDACEAE.

Oxalis corniculata L.

ZYGOPHYLLACEAE.

Tribulus cistoides L.

[3] Horace Mann. Flora of the Hawaiian Islands. Communications Essex Institute, Salem, Mass. 1871.

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MELIACEAE.

Melia azedarach L.

EUPHORBIACEAE.

Euphorbia celastroides Bois.
Euphorbia geniculata Ortega.
Euphorbia peplus L.
Euphorbia pilulifera L.
Euphorbia Stokesii, sp. nov. (See page 27.)

SAPINDACEAE.

Cardiospermum microcarpum H. B. K.
Cardiospermum halicacabum L.
Dodonaea viscosa L.

MALVACEAE.

Abutilon abutilon (L.) Rusby.

Although one of the most common naturalized plants all over the group it has not been recorded before. *A. indicum* is also naturalized on the group.

Abutilon incanum G. Don.
Gossypium tomentosum Nutt.
Malvastrum tricuspidatum A. Gray.
Paritium tiliaceum St. Hil.
Sida fallax Walp.
Sida rhombifolia L.
Thespesia tilifolia St. Hil.

STERCULIACEAE.

Waltheria americana L.

CACTACEAE.

Opuntia tuna Mill.

ARALIACEAE.

Reynoldsia sandwicensis A. Gray.

UMBELLIFERAE.

Hydrocotyle verticillata Thnb.

PRIMULACEAE.

Lysimachia spathulata B. & H.

Collected by Remy; not seen by Stokes.

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PLUMBAGINACEAE.

Plumbago zeylanica L.

SAPOTACEAE.

Chrysophyllum polynesicum Hillebr.

ASCLEPIADACEAE.

Asclepias curassavica L.

CONVOLVULACEAE.

Ipomoea batatus (L.) Lam.
Ipomoea insularis Steud.
Ipomoea pentaphylla Jack.
Ipomoea pes-caprae Sw.
Ipomoea tuberculata Roem & Sch., var. *trichosperma*.
Jacquemontia sandwicensis A. Gray.

HYDROPHYLLACEAE.

Nama sandwicensis A. Gray.

BORAGINACEAE.

Heliotropium anomalum Hk. & Arn.
Heliotropium curassavicum L.
Vitex trifolia L.

VERBENACEAE.

Verbena bonariensis L.
Priva aspera H. B. & K.

LABIATAE.

Plectranthus australis R. Br.
Plectranthus parviflorus Willd.

Another plant belonging to this family not yet sufficiently identified.

SOLANACEAE.

Lycium sandwicense A. Gray.
Lycopersicum esculentum Mill.
Nicotiana tabacum L.
Solanum nigrum L.

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MYOPORACEAE.

Myoporum sandwicense (A. DC.) A. Gray.

RUBIACEAE.

Morinda citrifolia L.

LOBELIOIDEAE.

Brighamia insignis A. Gray.

Mr. Stokes observed on inaccessible cliffs. The plant is known from Kauai, Molokai and Lanai, but not as yet from the other islands.

Delissea undulata Gaud.

Brigham in herbarium of Bishop Museum; not seen by Mr. Stokes. Dr. Brigham says that this is the only *lobelia* that he saw on the island, and that it was more plentiful over the area where it occurred than perhaps any other lobeliaceous plant occurring in an equal area on the group.

Lobelia neriifolia Gray, var.

Field experience is showing this to be a variable species; the present specimen collected by Mr. Stokes may prove to be a distinct variety.

GOODENIACEAE.

Scaevola Koenigii Vahl.
Scaevola coriacea Nutt.

Collected by Remy; not seen by Stokes.

COMPOSITAE.

Ageratum conyzoides L.
Artemisia australis Less.
Bidens pilosa L.
Campylotheca micrantha (Gaud.) Cassin.
Erigeron albidum A. Gray.
Lipochaeta lobata DC.
Lipochaeta succulenta DC.
Vernonia cinerea (L.) Less.
Sonchus oleraceus L.

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Euphorbia Stokesii, sp. nov.

Frutex 6 dm. altus; foliis oppositis, obovatis, turbinatis vel emarginatis, carnosis, glabris, 4.2–4 cm. longis, 2.6 cm. latis, cum petiolis 5 mm. longis; stipulis membraceis. Axillares, solitari cum pedicellis 1.3–1.5 cm. longis; involucro campanulato, glabro, 2 mm. longo, cum 5 glandulis latioris quam altioris; lobis triangularis, tridenticulatis; staminodibus exsertis, bracteolis divisis et fimbris. Capsula glabra, 3 mm. longa; seminibus ovoidis, tetragonis, scorbiculatis, cinereis.

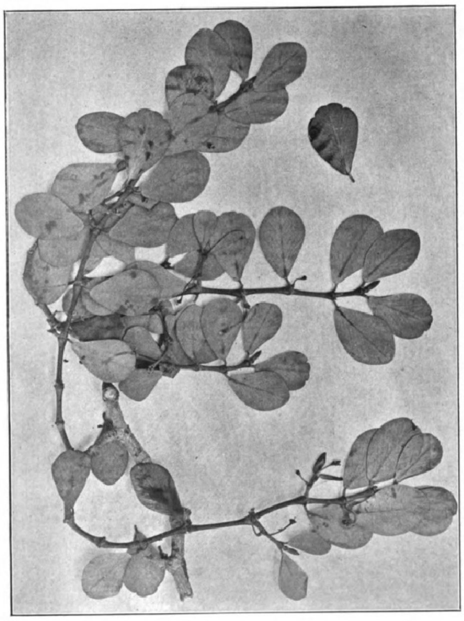
Type locality, near the beach at Kii, Niihau, H. I. J. F. G. Stokes. January, 1912.

A low prostrate shrub 6 dm. high; with thick nodose branches, sub-herbaceous at the ends. Leaves opposite, obovate, often emarginate or turbinate, rather fleshy, glabrous, bluish green above, paler beneath, 4.2–4 cm. long, 2.6 cm. wide; with petioles 5 mm. long. Stipules low rounded, membraneous. Flowers axillary, single, on pedicels 1.3–1.5 cm. long. Involucre campanulate, 2 mm. long, glabrate; throat pubescent; glands 5, broader than high; lobes triangular with three minute teeth. Staminiphores exserted; bractlets about one-half the length of the staminiphore, split and fimbriate. Styles short. Capsule glabrous, 3 mm. long, on a short stalk. Seeds ovoid, tetragonous, scrobiculate, ash-colored.

This plant can be readily distinguished from all other species of the *multiformis* group of these islands by the character of its very different leaves. They are relatively much wider and more fleshy than those of other members of the group.

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I. Euphorbia Stokesii Forbes.

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2. Close view of the cliffs near Kaali at the water hole where many of the cliff plants were collected.

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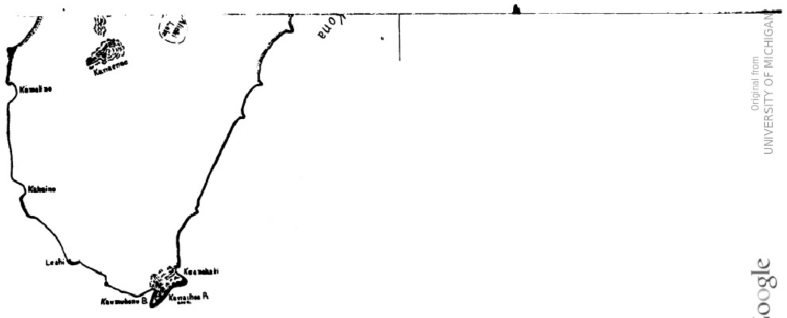


3. Distant view of the table land looking from Kii toward Kaali.

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4. Map of Niihau compiled from survey by S. M. Kerns; the lakes are added from Mr. Stokes' notes, and the names of localities were furnished Mr. Stokes by Mr. Robinson the owner of the island.

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REPORT.

IT HAS been well said by a wise man of the East that we know not our place until we look at it from afar. During most of the year 1912 the Director of this Museum has been perhaps as far from the scene of his daily labor as is possible on this planet, and perhaps the perspective had more in it than the microscopic view. Be it as it may, he returns with a broader view of the Bishop Museum than he had before, and with thanks to the Trustees who enabled him to enjoy that view. As he borrowed the eyes of many others engaged in work similar to his own in other parts of the earth, while in their pleasant company on the flat plains of Chicago, in the frosty atmosphere of Boston, in the rush and hurry of New York, in the budding Spring of Washington, in the conservatism of London, the academic groves of Oxford and Cambridge, the quaint stillness of Holland that seems almost like a dream, the granite rocks and primeval forest of Stockholm, the new pastures of St. Petersburg and Moskow and Budapest, the great wisdom of Vienna, the beautiful Art of Dresden, the bookish atmosphere of Leipzig and Frankfurt am Main, the growing mastership of Berlin, the most modern of museums under shadow of the spires of Cologne cathedral, the oceanic spoils of Monaco, the long familiar haunts of Rome and Naples, the revivified Cairo, Columbo, the Straits Settlement that has become Singapore, the mysterious Java with its great Garden of Buitenzorg and its long buried Buddhistic ruins, the new Port Darwin with memories of the Master, Thursday Island and the Barrier Reef with memories of Cook, the young and yet well-grown museums of the Colonies, the Alps of the southern hemispere around Mt. Cook, on to the once cannibal islands of Fiji—now a prosperous colony of our own race—in these places

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and many others the Bishop Museum was already known, and in all a kindly feeling was shown for the little museum in Honolulu; and there were those who showed its publications as valued possessions, and helped the Director to prize more highly the little workshop in the midst of the Great Ocean where he had at times been aweary and feeling, if not asking, *qui bono?*

And now as the reports of the Curators of the Museum of the work that has been going on there all the while come to him for examination and comment, he cannot but feel that the munificent and wise foundation of Charles Reed Bishop has not been in vain, it has not produced a merely temporary show. The work goes on: it is not merely a personal one but one that fits in and is wanted in the company of those who are doing their best in the museums of the world. The Bishop Museum has its place among these many institutions and seems to be welcomed as a useful brother.

Our printery has at last received its new furniture and is in most satisfactory order. This report will be the first issue from the renovated office. The Annual Report for 1911 was issued during this year but before the arrival of the new apparatus. Beyond that the work has been internal—notices, letterheads, labels, address cards and the many small but very important needs of a working museum; for this reason the assistant, Mr. A. Perry, has been temporarily transferred to the library where he has been very useful.

For the library our busy Librarian Miss E. B. Higgins reports a long and excellent list of accessions, which will be found later in the report, but an abstract of their number may be given here:

Bound books	202	
Books in paper covers	2026	
Total received	2228	
Exchanges received bound	9	
Exchanges received in paper covers	903	912
By purchase and gift, bound	193	
By purchase and gift, unbound	1123	1316
Total		2228
Plates, illustrations, photographs		260

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Our binding is so expensive that it may prove good economy to do our own binding. During the year we had bound 72 volumes of many sizes, but mostly bound in durable buckram; 213 volumes are ready for binding but are awaiting information as to cost at the large libraries and museums. The large libraries generally and the museums frequently have their own binderies, but our information is not complete enough to make a report at present. As will be seen our exchanges come in parts, and to be preserved and used must be bound.

During his absence the Director, under authorization of the Trustees, made arrangements not only for some additional exchanges, but also for completing our sets of desirable publications. Many of the old societies recognize the importance of a reference library for the use of scientists and explorers passing through our port, and are endeavoring to complete our sets as old and rare parts may be found. I have often been asked how our own publications can best be bound for use, and I have advised libraries to bind each of the quarto memoirs separately for convenience in handling—a course followed by many museums that exchange with us, and we shall endeavor to make this course more practicable by furnishing an index to each complete part (as we have already done in several cases), as well as to the entire volume.

The modeler, Mr. J. W. Thompson, has made many casts of fish during the year and also many casts of rare specimens borrowed for the purpose. I found no work during my journey so artistic as his. In almost every case where casting is used it was quite unnecessary to put "cast" on the label.

During the Director's absence Mr. J. F. G. Stokes was Acting Director; as Curator of Polynesian Ethnology he reports that while there were no large collections added to the Museum either by gift or purchase, there were still considerable accessions, among the

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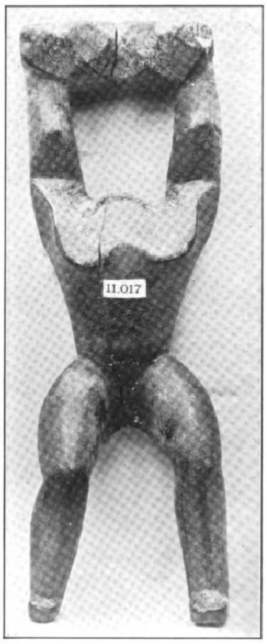


FIG. 1.

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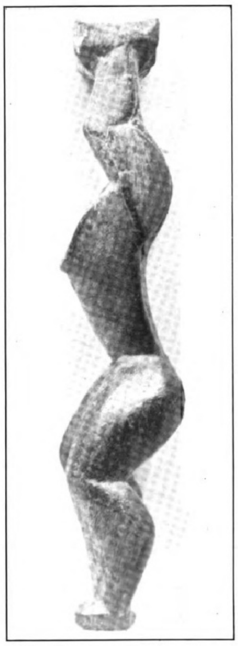


FIG. 2. ANCIENT HAWAIIAN FIGURE.

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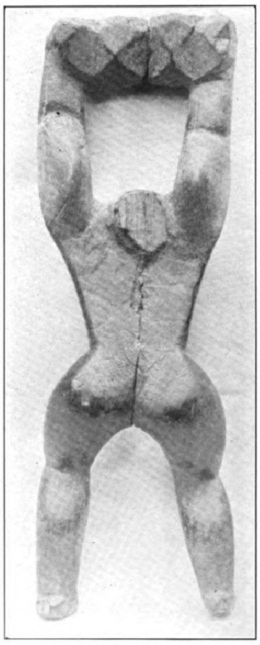


FIG. 3.

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more noteworthy collections from Mr. George P. Cooke of Molokai, and Dr. W. M. Kerr, U. S. N. Of individual specimens, a wooden image found in Hilo (Figs. 1-3) and given by Mrs. S. W. Wilcox of Kauai; a kapa from Niuë (Fig. 4) given by Mr. S. Percy Smith of New Zealand; three New Guinea feather head ornaments by Mr. F. Muir of Honolulu; a Fijian club (Fig. 5) given to the Director by Sir Everard im Thurn, formerly governor of Fiji; and a Melanesian adze (Fig. 6), also given to the Director by Mr. J. Edge-Partington, both of these latter specimens turned over to the Museum by rule of the Trustees. Of the purchases, the cast of Taaroa (Tanaloa) by Brucciani; this curiously carved figure was formerly in the cabinet of the London Missionary Society and now by purchase the property of the British Museum; it is the most elaborate of the images that have come to us of Polynesian origin; I may add that I have, by the courtesy of Sir C. H. Read of the British Museum, photographs of all the interesting idols of the Polynesian people in that museum.

Of the field work Mr. Stokes reports: "In January I went to Niihau, through the kindness of Mr. Aubrey Robinson, with the intention of examining the heiau, investigating the report of the existence of petroglyphs at the boat landing at Kii, and collecting plants and shells for the other departments. One heiau was measured and photographed and the sites of two other heiau (?) noted. The results in the case of the petroglyphs were negative. Of plants, 125 sheets were collected, including a new species and a new variety, and arrangements were made with the Hawaiian Mr. Robinson loaned me to get others from the southern side of the island resulting in an additional 35 sheets. The fossil beds at Kiekie were carefully gone over and photographs made of the deposits: the shells collected are mentioned in the report of that department.

"After leaving Niihau I went to the top of Mount Kahili in Kauai, and made notes on the remains of the ancient fort there, mentioned by Jarves. For aid in this matter thanks are due to

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FIG. 4. KAPA FROM NIUE.

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Mr. J. K. Farley of Koloa who provided me with a conveyance and accompanied me to the beginning of the steeper ascent. In Koloa I visited the sand dunes at Makahuena Point to look for fossil shells, with the result reported by that department.

"While on Kauai the collections of the following residents were examined and interesting specimens photographed or borrowed: Mrs. V. Knudsen, Mr. E. Knudsen, Mr. Albert Wilcox and the Misses Wilcox, the latter the owners of the Kahlbaum collection. The cast of the large stone covered with petroglyphs

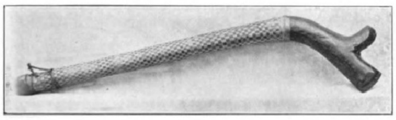


FIG. 5. FIJIAN CLUB GIVEN BY SIR EVERARD IM THURN.

at Miss M. Damon's country place at Moanalua Valley was completed and placed in Hawaiian Hall." The renewal of considerable flooring in the Picture Gallery and elsewhere was rendered necessary by the ravages of termites.

Mr. Charles N. Forbes, Curator of Botany, reports: "All material received prior to May, 1912, has been classified, mounted and incorporated into the Herbarium; while most material received since that date has been classified. A large amount of time has been spent in attempting to exterminate the various insect pests which attack the specimens. During the year the whole Herbarium has been fumigated, once with carbon disulphide and twice with hydrocyanic acid gas, the last being necessary to check an invasion of cigar beetles which did a large amount of damage during my absence on Molokai. In the last few months work was started in poisoning all the specimens with corrosive sublimate.

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FIG. 6. ADZE GIVEN BY J. EDGE-PARTINGTON.

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"Besides the usual short trips on this island, two extended excursions were made to study the flora in the field. The first was to Mokuleia Valley on the Kaala range of this island, where three weeks were spent. This mountain is of great interest botanically for the reason that its flora is as distinct from the main range of Oahu as is the flora of any separate island of the group. For courtesies extended we are especially indebted to Mr. P. M. Pond, whose ranch was my headquarters, and also to Mr. C. C. Pittam my host who made my stay enjoyable in many ways. I also wish to thank Mr. C. J. Austin for permission to explore certain adjacent lands belonging to the Dillinghams of which he had charge. This gentleman has previously done many kindnesses for my department.

"The time between June 11 and October 3 was occupied in investigating the flora of Molokai. I consider this the easiest, and in many ways one of the most satisfactory islands to cover; although as a whole its flora is not so rich as that of some of the other islands. Favored with four months of unusually dry weather I encountered none of the hardships or dangers described by some collectors who have visited this island.

"My first base station was at the Molokai Ranch, where Mr. G. P. Cooke aided me in so many ways that it will be impossible to ever show our just appreciation of his kindness. The first trip from here was to the sheep station at Mahana, and from this place the whole western end of the island was covered. The next trips were to mountain houses on the main range above Kalae. I am indebted to Mr. Henry Meyer for permission to collect on the lands of Kalae. After this trips were made over the country adjacent to the ranch, and to the bottom of the settlement trail. We are indebted to the Board of Health through Mr. J. D. McVeigh, the superintendent, for permission to take this last trip. I also wish to thank the Board of Health for their kind offer of a cottage at the settlement. I did not take advantage of this privilege as I presumed that nearly all the representative flora could be obtained

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in the surrounding region without running the apparently unnecessary risk. While at the ranch Messrs. James Munro and Scott Pratt also helped me in many ways.

"The next trip was arranged through the kindness of Mr. James Dunn, and was to Mr. Frank Forster's mountain house above Kamalo. This was the most satisfactory collecting ground on the island. From here one is able to penetrate into the mountains above and below Puu Kolekole in every direction. The Pelekunu trail was followed to the bottom of the valley, while the pali was followed on the right to the highest point, Kamakou, and on the left for quite a distance on the edge of the so-called swamp country.

"After returning for a few days to the ranch, my base station was shifted to Pukoo where Mr. Rexford Hitchcock generously gave me the use of a cottage which made a very comfortable botanical laboratory for the remainder of the trip. The greater number of the ridges and gulches between Kamalo and Halawa were visited from this station in day trips. Judge C. C. Conradt gave me much information about the trails in this vicinity and otherwise added to the pleasure of my stay. Two extended trips were made from this base, the first to Mr. J. F. Brown's ranch at Halawa, whence the surrounding mountains including Halawa Valley and the ridges on either side were visited. I wish to thank Mr. Brown for his kindness in allowing me to camp on and explore this territory.

"The second trip was over the regular trail across the mountain into Wailau valley. I employed James Naki as packer and guide in this region. During a short stay we went along the shore pali, up the makai pali of Olokui to the 2500 feet elevation, and up various sub-ridges of the main valley. We then took canoe to Pelekunu where I discharged the guide. Here I tied up with the trip previously taken to the bottom from Kamalo and visited numerous side ridges as well as the small valley to the right of Pelekunu. The return was made by steamer to Kamalo, thence

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back to Pukoo. Another week was spent here in order to try to get certain plants not in flower earlier in the season, before returning to Honolulu by way of Kaunakakai.

"No new exchanges have been arranged owing to the fact that Pacific island material is scarce and difficult to obtain. The additions to the Herbarium are as follows:

Mr. C. J. Austin, Hawaii	5
Dr. W. T. Brigham, Papandajan, Java; Mt. Cook, N. Z.	4
Mr. Alfred Butt, Drosera from New Zealand	1
A. F. Judd, Esq., Hawaii	5
Rev. J. M. Lydgate, Kauai	44
Mr. J. F. G. Stokes	125
Mr. Kalua Keale, Niihau	35
Mr. G. P. Wilder, Maui and Oahu	14
Mr. J. F. Rock, exchange Hawaiian plants	3
Philippine plants purchased	953
Specimens collected	4000
Total additions	5189

"Also 63 specimens of Hawaiian woods from the Bureau of Agriculture and Forestry.

"The Abbe Faurie has made a collection of Hawaiian plants of which some 80 or more so-called species have been described as new, but for the most part the descriptions are so meagre that one cannot come to any decision regarding them without the actual specimens in hand."

In the department of Pulmonata Dr. Cooke, the Curator, reports the work accomplished as greater than in any previous year. During the year 52,837 shells were catalogued, or an average of over 1000 per week. These are distributed over 4445 catalogue numbers. Of those catalogued 38,662 are fresh and 14,175 fossil material. Of the Thwing collection 12,156 specimens were catalogued. Of this collection the arboreal shells from the Koolau range remain to be catalogued, and there are probably in the neighborhood of 15,000 to 20,000 specimens.

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"Forty-one days were spent in the field by the Curator, during which 35,533 specimens were collected. Of these over 14,000 were fossil. The most important trip was to the island of Molokai, during which over 14,000 recent shells were collected, and four new deposits of fossil shells were discovered. The next trip of importance was to Kaipapau, Oahu, where besides collecting a number of recent specimens several very remarkable fossil deposits were discovered, in one of which the shells averaged over 700 to the cubic inch of soil."

Shells have been received and catalogued as follows:

The Curator	35,533
Members of the Museum staff	1,860
I. Spalding	449
J. S. Emerson	1,476
A. F. Judd	93
Whitney collection, given by Mr. McInerny	561
Thwing collection	12,156
Others*	709
Total	52,837

In the geological department we have received from Chevalier F. A. Perret a lava bomb from Hawaii; Mr. F. B. Dodge, a bomb from Kilauea; from the Hawaiian Volcano Research Association, lava cast of banana stump, Hawaii.

In other departments: Father Rougier, Fanning Island, plastron of tortoise, Christmas Island. Andrew C. Westervelt, Honolulu, tail of male lyre-bird; and 5 madreporarian corals, Fiji. Mrs. H. P. Baldwin, Maui, skeletal part of a gymnoblastic hydroid, Hawaiian Islands.

By purchase: 10 bird nests, 2 bird skins. Hawaii.

In giving below the table of attendance for the past year I have thought it interesting to compare it with that of the two previous years. The number of white visitors constantly

*In this lot were contributions from Misses Alice, Martha and Carolene Cooke, Messrs. R. Scudder, R. and W. Hitchcock, W. Mutch, D. Pratt Podmore, W. P. Alexander, Weedon, R. von Holt, O. P. Emerson, and Charles M. Cooke (111).

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increases. In comparing the Chinese figures with the Japanese it should be remembered that while the number of Japanese on these islands, or for the matter of that in Honolulu and the neighborhood, greatly exceeds that of the Chinese, the proportion of the latter visiting the Museum is proportionately greater. I suppose also that notice should be taken of the constantly decreasing number of Chinese in our population owing to the exclusion and the return to China. The increase in white visitors is largely due to the increased tourist travel.

	Whites.	Hawaiian.	Portuguese.	Chinese.	Japanese.	Others.
1910	5457	1402	555	1388	2115	185
1911	6210	1745	758	1046	1631	202
1912	7318	1185	744	1278	1881	175

TABLE OF ATTENDANCE.

1912.	Whites.	Hawaiians.	Portuguese.	Chinese.	Japanese.	Others.	Days open.	Average.	Totals.
January	894	98	115	63	115	14	23	56.5	1,299
February	970	136	56	211	203	5	22	70.2	1,581
March	762	153	95	119	211	23	22	62	1,363
April	612	136	50	90	141	28	22	49	1,057
May	629	102	78	144	127	7	21	52	1,087
June	490	66	33	123	156	20	20	45	888
July	521	76	33	72	145	17	21	42	864
August	603	87	57	161	133	16	23	46	1,057
September	424	113	69	69	286	12	21	47	973
October	408	83	66	69	102	8	22	34	736
November	414	73	47	105	173	10	21	40	822
December	591	62	45	52	89	15	21	40.6	854
Totals	7,318	1,185	744	1,278	1,881	175	259	48.7	12,581

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List of Accessions.

ETHNOLOGICAL.

By Gift.

Harry G. Beasley, England. (11,027)
Cast of sacred jade hook. New Zealand.

Dr. W. T. Brigham, Honolulu. (11,025)
Tapa. Samoa.

Mrs. W. R. Castle, Honolulu. (11,018–11,023, 11,081)
4 adzes, poi pounder, kapa. Hawaiian Ids.
Adze. South Pacific.

Dr. C. Montague Cooke, Honolulu. (11,040, 11,067–11,072)
Noa stone, bowling stone partly made, 3 adzes, 2 chipping stones. Hawaiian Ids.

G. P. Cooke, Molokai. (11,028–11,039)
2 sinkers, 2 bowling stones, 1 hammer, 4 adzes, part of stone mirror, stone drill bit, specimen of coral sandstone. Hawaiian Ids.

J. Edge-Partington, England. (11,080)
Adze. New Guinea. (Fig. 6.)

C. N. Forbes, Honolulu. (11,065–11,066)
2 adzes. Hawaiian Ids.

Dr. Wm. M. Kerr, U. S. N. (11,059–11064)
Arrow. New Guinea.
2 spears. Admiralty Ids.
Model of house, rat-trap, flint, steel and tinder-box. Guam.

A. M. McBryde, Honolulu. (11,016)
Ancient oo. Hawaiian Ids.

F. Muir, Honolulu. (11,056–11,058)
3 feather head-dresses. New Guinea.

M. L. H. Reynolds, Honolulu. (11,055)
Bowling stone. Hawaiian Ids.

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S. Percy Smith, New Zealand. (11,024)
Tapa. Niuë. (Fig. 4.)

Sir Everard im Thurn, England. (11,079)
Ancient club. Fiji. (Fig. 5.)

Andrew C. Westervelt, Honolulu. (11,082-11,083)
Flax dress, jade adze. New Zealand.

Mrs. S. W. Wilcox, Kauai. (11,017)
Wooden idol. Hawaiian Ids. (Figs. 1-3.)

By Purchase.

Cast of idol Taaroa. Rurutu. (11,026)

4 adzes, 2 poi pounders, 3 grindstones, 2 polishing stones, 2 bowling stones, slingstone, mirror. Oahu. (11,041-50, 11,074-78)

Stone throwing club. Hawaii. (11,051)

By Loan.

A. Bloxam, New Zealand. (L597)
Wooden idol. Hawaiian Ids.

Bruce Cartwright, Jr., Honolulu. (L594-596)
Poi pounder, 2 bed tapas. Hawaiian Ids.

G. P. Cooke, Molokai. (L592-593)
Corrugated wooden bowl, fishing stone. Molokai.

D. Thaanum, Hilo. (L551-555, 571-574)
3 stirrup poi pounders. Kauai.
Pestle, bird stone, 3 conical poi pounders. Hawaii.

William Wagener, Hawaii. (L576-591)
3 sling stones, bowling stone, 2 stone sinkers. Lanai.
Stone fish god, 2 stone anchors, 2 lamps, poi pounder, stone ball, tobacco pipe. Hawaii.
2 stone adzes. South Pacific.

S. W. Wilcox, Kauai. (L556)
Calcite hook for lei palaoa. Kauai.

The Misses Wilcox. Kauai. (L557-570)
2 stirrup poi pounders, 1 ring poi pounder, pestle, 2 stone cups, stone sinker, 3 stone drill points, stone gouge, ivory comb, shell and small ivory hooks for lei palaoa. Hawaiian Ids.

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GEOLOGICAL.

By Gift.

Hawaiian Volcano Research Association. (11,052)
Lava cast, banana stump. Hawaii.

F. B. Dodge, Hawaii. (11,053)
Lava bomb. Hawaii.

F. A. Perret, Naples. (11,054)
Lava bomb. Hawaii.

OTHER DEPARTMENTS.

Father Rougier, Fanning Id. Gift. (11,073)
Ventral shell of tortoise. Christmas Id.

Andrew C. Westervelt, Honolulu. Gift. (O4734)
Lyre-bird's tail. Australia.

Purchase. (O4722-4731)
10 birds' nests, 2 bird-skins. Hawaii.

Mrs. H. P. Baldwin, Maui. Gift.
Skeletal part of a gymnoblastic hydroid. Hawaiian Ids.

Andrew C. Westervelt, Honolulu. Gift.
5 madreporarian corals. Fiji.

ADDITIONS TO THE LIBRARY.

By Exchange.

ADELAIDE, SOUTH AUSTRALIA.

Royal Society of South Australia.—Transactions and proceedings, xxxv, 1911.

South Australian Museum.—Report, 1910-1911.

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Indian Museum.—Catalogues: Mammalia, i, ii; Mantodea, 1-2; Moths, i-vii and index.—Records, iv, 8-9; vi, 4-5.—Illustrations of the zoology of the "Investigator".—Malacostraca, plates i-lxxix; Entomostraca, plates i-v; Fishes, plates i-xliii; Mollusca, plates i-xx; Echinoderma, plates, i-v.

Asiatic Society of Bengal.—Journal, lxxiv, title; Journal and proceedings, v, title and index; vi, 7-11; vii, 1-3.

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Harvard University Library.—Report, 1911.

Museum of Comparative Zoology.—Bulletin, liii, 6-10; liv, 9, 11-15; lvi, 1.—Memoirs, xxvii, 4; xxxiv, 4, and title; xxxv, 3-4; xxxviii, 2; xl, 4-5; xliv, 1.

Peabody Museum.—Annual report, 1910–1911.

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South African Museum.—Annals, vii, 5; ix, 2; x, 2-3.

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Società Italiana di Antropologia.—Archivio per l'antropologia e la etnologia, xli, 3-4.

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Bound books received by exchange	9	
Paper-covered books and pamphlets	903	
Total by exchange		912
Bound books received by purchase and gift	193	
Paper-covered and pamphlets by purchase and gift	1123	
Total by purchase and gift		1316
Bound books received in 1912	202	
Paper-covered and pamphlets	2026	
Total		2228
Illustrations, photos, paintings, maps		262

Of above pamphlets 578 represent 129 complete but unbound volumes.

Total number of volumes received in 1912	331	
Pamphlets and parts of volumes	1448	
Total		1779

The Fornander collection of Hawaiian manuscripts purchased by Mr. Bishop and presented to the Museum finally reached the Museum during the present year.

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OCCASIONAL PAPERS

OF THE

BERNICE PAUAHI BISHOP MUSEUM OF POLYNESIAN ETHNOLOGY AND NATURAL HISTORY

VOL. V.—No. 5.

REPORT OF A JOURNEY AROUND THE WORLD TO STUDY MATTERS RELATING TO MUSEUMS : 1912

BY WM. T. BRIGHAM, Sc.D.

WITH INDEX TO VOLUME V.

HONOLULU, H. I.
BISHOP MUSEUM PRESS.
1913.

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REPORT.

WHEN it was decided that the Director of the Bishop Museum should for a second time make a visit of inspection, or rather of inquiry, to the principal ethnological collections both in America and Europe it was so late in the season that it was necessary to pass rapidly through the United States and finish the very important work in Europe before the heat of summer made the more southern museums unbearable. It was also recognized that some museums connected with educational institutions would probably be closed during the summer vacation. There was little time for preparation before sailing from Honolulu on April 10th, 1912, and although it was decided to continue the journey to Australia and New Zealand, where very important museums dealing largely with the Pacific region (which limits the scope of the Bishop Museum) had made important changes since the last official visit in 1896, the plans were not elaborated fully until reaching Boston ten days after sailing from Honolulu.

The general itinerary had been sketched and the time that could be allotted to each station determined in the beginning by the knowledge gained in former journeys, but even after eliminating certain collections of minor importance that could not possibly be brought within the date fixed in the Director's mind for the return to Honolulu, it appeared that the work remaining could not be properly done single-handed, and with the urgent advice of family and friends the Director decided to take with him, on his own responsibility, a secretary to take notes and relieve him of the many business arrangements of such an extensive and hurried trip. The alternative suggested itself of visiting only the new museums, and those not fully examined on his first visit in 1896, but the remembrance of the grand work being done in almost all of the museums seen then, and the promise this gave of still farther improvement, led the Director to abandon this plan, whch might do for a less important mission.

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The fortunate selection of Mr. Clarence M. Wilson of Boston for this post proved the wisdom of the advice followed, and the fulness of this report as well as the work done in the apparently neglected American museums later, together with many suggestions of practical value, must be credited to this very efficient secretary and fellow-traveler.

In San Francisco the museum of the California Academy of Science had disappeared in the terrible fire, and many good specimens of Marquesan and other Polynesian origin were unfortunately lost. In the Oakland public museum are some good specimens I have examined when in possession of their collector.

At Chicago the schedule of the trains allowed a few hours which were devoted to a visit to the Field Museum (Fig. 1), where I found my friend Dr. C. F. Millspaugh had just returned from a long journey, and by his courtesy I was enabled to see many improvements, especially in the Botanical Department where Dr. Millspaugh has had most beautiful glass enlargements of flowers and their fertilization, fruits and fungi prepared by a most efficient corps of assistants. Notes were also made on the good mounting of corals. Dr. F. J. V. Skiff, the well-known Director, I also met for a few moments as he was starting for Europe that day by another route, and we met again in Moskau.[1]

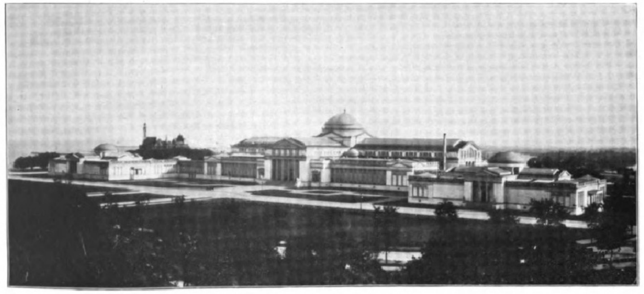
In Washington I visited the new National Museum (Fig. 2) and was entertained by Dr. W. H. Dall and Mr. H. W. Henshaw, head of the Biological Department of the Agricultural Bureau. Many skulls, a portion of the game collected in Africa by ex-President Roosevelt, were seen, but the arrangement of the new building was not complete enough, nor the time at my disposal sufficient to make a thorough inspection; when in order the collections will be worth a special visit. The Carnegie Administration Building (Fig. 3) was also visited, and although I was not fortunate enough to find Dr. Woodward, the obliging Secretary showed me over the building and explained its uses. A part of the day in this beautiful city was used in obtaining the necessary passport for travel in Russia, and also a letter of introduction from the Department of State, to provide for possible needs.

The Peabody Ethnological Museum in Cambridge was familiar from many former visits and from its most valuable publications;

[1] Illustrations of the contents of this museum are given in the sequel.

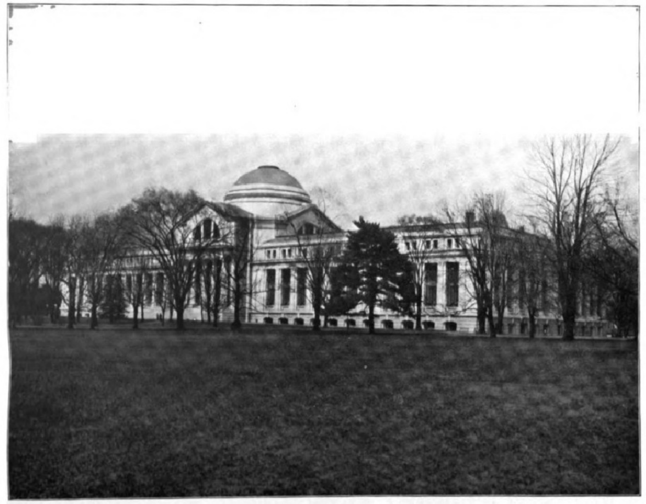
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1. FIELD MUSEUM, CHICAGO.

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2. THE NATIONAL MUSEUM, WASHINGTON, D. C.

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an abstract of the Pacific region ethnological collections is given later. Salem, always a bewitching city in more ways than one, had also to be passed by, but was not forgotten, as the list given later of the Polynesian treasures of this greatest of New England's Pacific region collections will fully prove. Andover had one or two Hawaiian relics that have been the subject of much unavailing correspondence. Generally there is little of Pacific interest in the Eastern states since the removal of the very interesting



3. CARNEGIE INSTITUTION ADMINISTRATION BUILDING.

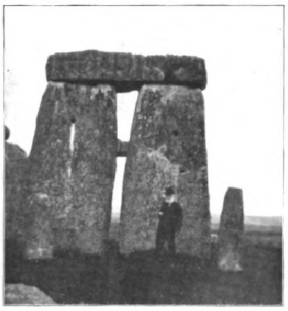
collection of the American Board of Commissioners for Foreign Missions to the Bishop Museum. The Boston Society of Natural History once had a fine series of Hawaiian lavas and of both Hawaiian and East Indian corals collected and given by the author of this report; whether in the crowded condition of the collections they are still on exhibition or even in existence I do not know.

We left Boston April 30th on the Laconia, a fine new boat of the Cunard line, and after an eight day passage far to the south to avoid icebergs, unusually abundant this season, landed at Fishgard and after a charming ride through Wales arrived in London where we made the final arrangements for the campaign which were strictly adhered to throughout the journey. Hotel rooms

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were engaged, railway and steamer tickets secured as far as Australia, with the exception of those in Russia and Java, and in no case were we disappointed or delayed. I may add that everywhere we were received with cordial welcome and granted every facility for our work; and if we did not accomplish all that we desired, it was due to the shortness of time allowed and the absence of a few Curators on their summer vacations.



4. TRILITHON AT STONEHENGE.

Our itinerary was generally as follows: Before finally leaving London we enjoyed a side journey to Salisbury whence we visited Stonehenge and were enabled to compare this megalithic structure (Fig. 4) with the Tongan trilithon of our Pacific region. We enjoyed, as every archæologist must, this wonder of Salisbury plain which is at present well cared for although private property.

Sunday, May 12th, I left London early for Greywell, the residence of my old friend J. Edge-Partington whose well-known "Album" has been of so much use to all museum curators and archæologists generally. Mr. Partington has spent some time at

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the Bishop Museum, and this morning met me at the station and a short drive through the charming hedge-bordered roads brought us to his quaint home the Kiln House, where I examined his private collections and had the pleasure of meeting his family,



5. PRIMITIVE ADZE FROM NEW GUINEA.

including his son who is Lieutenant-Governor of the Solomon Islands British Colony under Governor Woodford, and now at home on leave. I was thus able to see the collections he brought home and also settle some questions that had puzzled me about the methods of the islanders. After a most agreeable day I returned late to London with a memento of my visit in the form of a primitive adze that I had long desired for this Museum (Fig. 5). Men

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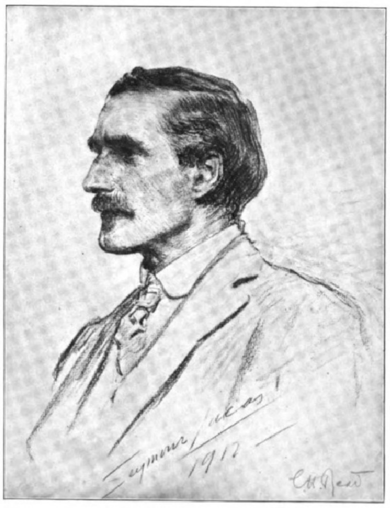
6. THE BRITISH MUSEUM.



7. GLASS AND CERAMIC GALLERY, BRITISH MUSEUM.

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8. SIR CHARLES HERCULES READ.

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9. MR. T. A. JOYCE.

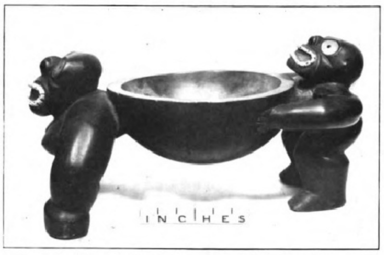
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IO. CARVED WOODEN BOWL, BRITISH MUSEUM.

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who, like Mr. Partington, make private collections with knowledge are doing work for ethnology that cannot always be done by the large museums, and when such collections come at last to the suitable museum they are regarded rightly as among the most useful acquisitions.



11. CARVED WOODEN BOWL, BRITISH MUSEUM.

A visit to Kew Garden and its museums showed considerable increase and improved arrangement, especially in the economic museum, but the day was saddened by the remembrance that my host on my first visit in 1866, then the indefatigable and hospitable Director Sir Joseph Dalton Hooker, who had also welcomed me on my last visit as he was still working over the *Flora Indica*, although no longer Director, had since passed away in the fulness of years and of well-earned honors. In that earlier visit I stood between Dr. Hooker and Rajah Brooke, the only spectators as the Court passed by on the preliminary view of the beautiful Horticultural Exhibition at Kensington. The Queen Mother Alexandra, then a young matron and Princess of Wales is, I believe, the only survivor of the principal personages in that royal cortége headed by Victoria, Queen and Empress.

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On a mission such as mine one turns at his earliest opportunity to the British Museum, that greatest repository of the museum world. Our visits were not once but whenever we could find a few hours, but I speak of the results from the combined experience.



12. CARVED WOODEN CUP, BRITISH MUSEUM.

The removal of the biological contents of the museum to Kensington certainly has left more room for the material portion, and it is perhaps fortunate that the works of civilized man in literature, art and science have not been separated from the products of what we are accustomed to call his uncivilized life; the statue of the Polynesian god is still under the same roof with the Attic images of the gods of Olympus; the pottery of Minoan make is cheek by jowl with the Greek vases of the proudest Athenian age; the quaint and unlovely figures from Rapanui are in cases but a few feet removed from the Elgin marbles!

Even in the new wing the architects have evidently had control and the sombre, temple-like structure of the old museum building has been faithfully adhered to with little regard for the exigencies of exhibition. And while on this matter of museum buildings we may cross the city some miles to Kensington and find in the Biological Museum the same architectural trouble. While the outside dress pleases the eye the ecclesiastical interior seems wholly unsuited to the wants of a museum. Director Skiff of the Field Museum of Chicago seems to have the right way when he makes the plans for the interior of his museum and allows the architect to attend to the *tailoring*. In Europe old palaces have so long been turned over for museum purposes that it is hard to shake off that pernicious custom, but museum buildings are springing up, where the yoke is shaken off, and better than palaces are being built for the housing of all-important collections.

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The interior of the Bloomsbury museum, however, has been used as well perhaps as is possible under the circumstances, as may be seen in Fig. 7. The use of light metal cases and glass shelving is very important where light comes only from above. Table cases with open base are also in evidence and add variety to the furnishing.



13. NECKER ISLAND STONE IMAGES, BRITISH MUSEUM.

It is hardly necessary to say that Sir Charles H. Read received us with his customary kindness, and in company with Mr. T. A. Joyce, who has charge of this particular department, we were soon in the midst of the ethnological treasures. Since my last visit the Museum has purchased the fine collection of the London Missionary Society which is especially rich in specimens from the south-east Pacific, and contains also not a few Hawaiian treasures,

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14. HAWAIIAN GOD FROM KAILUA, BRITISH MUSEUM.



15. HAWAIIAN GOD, BRITISH MUSEUM.

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especially carved bowls, some of which are figured in the first report but without indication of their size. This omission has now been supplied and I have photographs of all these with the size indicated. The Director was most generous in furnishing all the photographs we needed for illustration of various memoirs, and these were so promptly furnished that on my return to Honolulu they were awaiting me. The collection of Rapanui figures has been enriched by as finely carved a specimen as I have ever seen. The collections have also been labeled and are much more accessible than on my last visit. The kapa specimens are well mounted and arranged for study, a matter most museums have in the past neglected. The large collection of Hawaiian feather cloaks and capes has been withdrawn from public exposure except a very few specimens. This is found the wisest way even in countries where the light is not so actinic as in these Hawaiian Islands. The list of accessions will be found in the sequel, as it seems best to group those from all the museums together.



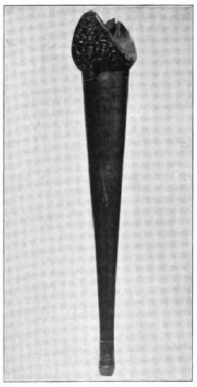
16. HAWAIIAN STICK GOD, BRITISH MUSEUM.

Among the Hawaiian specimens are several carved wooden bowls with human figures as supporters, a favorite motive, of which we have already figured examples in our publications.[1] The first, Fig. 10, is but 7.7 inches high but remarkably well carved, although the figures have very brutal faces. The second was obtained in 1854, Fig. 11, and it resembles more the common New Zealand treatment, with upright human figures both facing the same way; of these the eyes are of shell and the teeth good specimens of the sculptor's dentistry; like the first this is of small

[1] Memoirs, vol. ii, p. 358, fig. 162, for the Hawaiian; fig. 163 shows a rudely carved Maori bowl, and fig. 164 represents a specimen of Hawaiian origin in the Leiden Museum.

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size. A third specimen in the same line is shown in Fig. 12, in which the somewhat larger bowl seems to have been used for a liquid, having an exit through the mouth of one of the figures.



17. NEW ZEALAND TRUMPET, BRITISH MUSEUM.

There are two of the Necker Island stone figures, the larger 18 inches high, the other the smallest known (Fig. 13). Those in the Bishop Museum have been described and figured (Memoirs, I, pl. lxii). Of the wooden gods besides the large one figured in Occasional Papers, I, pl. xiv, there are two others noteworthy: one (Fig. 14) was obtained by Messrs. Tyermann and Bennett from a heiau at Kailua, Hawaii, and is 47.5 inches high; the other (Fig. 15) is much broken, is 54 inches high, and seems to represent a female form, although the features seem hardly those of the gentler sex; it was obtained from a heiau. To these may be added the little god 12.8 inches high (Fig. 16) which has an expression hardly god-like.

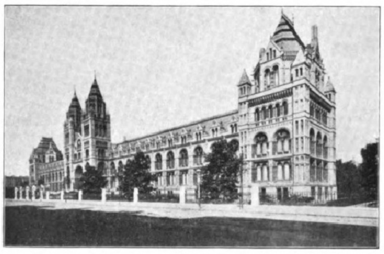
A New Zealand trumpet 25.7 inches long (Fig. 17) has the flare beautifully carved; these trumpets were usually carved in two pieces and fitted neatly together longitudinally; they are far from common in collections.

The Natural History Museum at Kensington has expanded far more than the public exhibits show, but these last include more of the well-mounted bird groups than before, and among animals the okapi is conspicuous. Series illustrating evolution, and es-

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pecially the development of wings, feet, feathers, etc., are presided over by a fine statue of Darwin (Fig. 19), while the bust of Sir William H. Flower, who was the moving spirit in the establishment of this new home for the biological collections, is conspicuous on the main floor (Fig. 21). The present arrangement of the entrance hall differs from the illustration in having the



18. NATURAL HISTORY MUSEUM, SOUTH KENSINGTON.

skeleton of an elephant in the middle of the floor. Unfortunately the objectionable architecture of the walls cannot so easily be changed.

In the Imperial Institute (Fig. 22) the colonial products are arranged partially, and we found a bronze statue of Sir Thomas Stamford Raffles, the great East Indian organizer and ruler of Java, but could obtain no photograph of this, which seems far superior to any we found later in the lands where much of his remarkable career was passed. If this inchoate collection could be completely reorganized and quadrupled it would be more worthy the imperial colonies, but at present it has too much the appearance of being the débris of some previous great exhibition, while the beautiful collection of Indian work from the former East Indian Museum is far too crowded. The scattering of the London collec-

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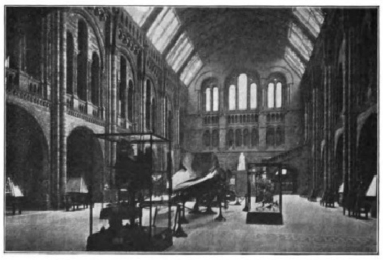


19. STATUE OF CHARLES DARWIN.

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tions is often puzzling, for in the Kensington art collections one might look for much of the carved and inlaid work of the empire. But our time was too short and our examination too cursory to criticise what will become a grand exposition as time and means are provided for the more complete differentiation and organization of the now separated collections. It must be admitted that for a stranger the distribution of exhibits is very confusing, and a



20. ENTRANCE HALL OF KENSINGTON MUSEUM.

government commission to sort out the material that can best be cared for and used for instruction in each of the great museums would seem a step in advance. I remember seeing on a former visit several fine Maori war canoe prows under a bench in the Science and Art Museum which, it seemed to me, would be more at home with the ethnographic collections of the British Museum. And there were many other instances needless to recount.

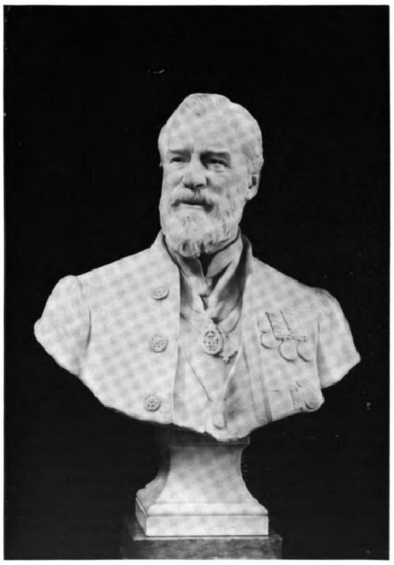
A morning was spent most profitably at the Royal College of Surgeons with Dr. William Pearson, the courteous Curator, who showed and clearly explained the many admirable preparations, mostly his own work. Especially interesting was the osteological department (Fig. 25) where are preserved many crania and not

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21. SIR W. H. FLOWER.

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a few skeletons of Polynesians. There were also good Maori heads showing the *moko*. If the plans I have made on this journey do not go aglee this Bishop Museum will sometime have a good series of skeletons of all the races inhabiting the Pacific region. There is not at present any museum collection sufficient for the study of Polynesian and Melanesian comparative osteology.



22. THE IMPERIAL INSTITUTE.

There are many great helps to the anthropologist in this great London museum.

The kindness of Mr. Hobson of the United States Embassy furnished us with passes to many places, among others to the Tower which we visited on the 18th, and there found a Hawaiian helmet, but that was unexpected, and to me more interesting were the alterations in the basement to which our diplomatic pass admitted us, and these, if doing away with some matters of considerable antiquarian interest, certainly have unveiled others which but for these invasions might have remained in oblivion for more centuries.

From this wonderful although sad page in English history we sought relief in a freer and broader field, and found this in the rooms of the Royal Geographical Society where we were received by the

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distinguished Secretary, Dr. J. Scott Keltie, LL.D. The very atmosphere of the place was geographical in the midst of the 50,000 volumes, 128,000 maps and more than 40,000 photographs. We received invitations both to the annual meeting and to the dinner in the evening, but I was able to accept only the former, and found it an interesting function including the presentation of awards by the President the Rt. Hon. Lord Curzon of Kedleston,



23. VICTORIA AND ALBERT MUSEUM.

to a number of persons who had distinguished themselves as geographers or travelers. In connection with the annual dinner that I had been unable to attend, I found that I had been expected to meet several distinguished members, but the most important, Sir Everard Im Thurn invited me to dine with him a few days later, when I found this distinguished traveler and former Governor of Fiji was chairman of a commission to revise the nomenclature of the Pacific islands, and it was gratifying to find that the Index to the Pacific Islands, published by the Bishop Museum, was likely to be of use in this behalf.[1]

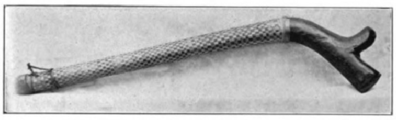
The next evening Mr. Wilson and I dined with the Council of the Royal Anthropological Institute before the regular meeting,

[1] The Fijian club shown in Fig. 24, now in the Bishop Museum, is a pleasant reminder both of Sir Everard and his labors in Fiji.

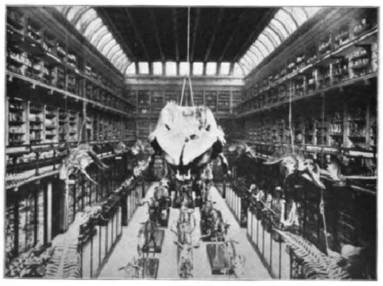
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and I had the pleasure of meeting A. P. Maudsley, Esq., the President, whose explorations in Guatemala are well known, and whose footsteps I had the privilege of following when making my photographs of the ruins of Quirigua. At the meeting later we listened



24. FIJIAN CLUB GIVEN BY SIR EVERARD IM THURN.



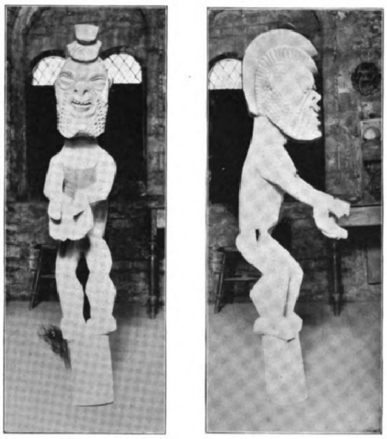
25. ROYAL COLLEGE OF SURGEONS.

to an interesting paper on Maori Skulls, by Dr. R. J. Gladstone, M.D., with exhibits, and then the discussion turned upon Polynesian origins, and the President called upon me, but I could only show what I considered valid objections to all the best known theories without offering any better theory of my own. Among

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those present Mr. A. W. F. Fuller of Sydenham Hill and Mr. Harry G. Beasley of Abbey Wood, Kent, both invited us to inspect their private collections on the following Saturday and Sunday, and in accepting these invitations, the one to luncheon, the other



26-27. HAWAIIAN IMAGE, FULLER COLLECTION.

to dinner, we spent several very pleasant and profitable hours. I confess to greater pleasure in inspecting the collection of an experienced and competent gentleman where the history of each thing is fairly in hand than in the mere inspection of a large public museum where the arrangement is generally perfunctory and the individualism of the article is buried in books of accessions or card

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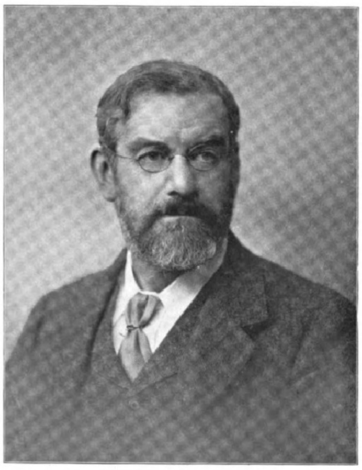
catalogues, things necessary and useful but not always vitalized. Personally I have learned more from the many private collections it has been my good fortune to visit than from much larger museums where the very abundance absorbs the individual specimen in the general collection.

At Mr. Beasley's we noted especially the Maori feather boxes, of which he has a large and choice collection; he has also other Maori specimens, and altogether a very interesting result of his careful selection. From the Chichester museum he obtained a Hawaiian feather cloak which will be described elsewhere. Mr. Fuller has a more general collection, one of the most interesting and valuable private collections we visited: among other treasures he has a Hawaiian feather cape, of which he has kindly sent a photograph with the history; a large and rudely carved Hawaiian image 52 inches high (Figs. 26 and 27), differing greatly from any other Hawaiian image known;[1] quilted kapa from Rapanui, Admiralty Islands spears, Fijian and Tongan clubs of good quality, and an extensive travel library.

It was natural that we turned our steps eagerly to Cambridge, for there Baron A. von Hügel has his unrivalled collection of Fijian material which all students of the Pacific region are anxious to have him publish; and here too were Dr. A. C. Haddon and Dr. W. H. R. Rivers, names well known and honored for their good work, especially in the western Pacific region. The day, May 23, was as fine as that favorable season can produce in England, and our walks on the banks of the Cam and through the college quadrangles filled us to the brim with the academic atmosphere. We called first on Dr. Rivers at his rooms in St. John's College, as we knew he was to leave town on the next day. I had met him in Honolulu and he received us most cordially. He took us to the old museum soon to be vacated for its new abode, and here Baron von Hügel was ready for us, and although much of his collection was in trays awaiting removal we were shown many gems and had much pleasant discourse on the origin and uses of

[1] I am sorry to say that its nature suggests to me the work of a carver of ship figureheads in which has been used as a model an inhabitant of an island much nearer London than is Hawaii; but this carver must have known the Hawaiian *mahiole* and general figure treatment; the hand is much larger and the mouth smaller than usual in Hawaiian images. I cannot say that it is not Hawaiian work.

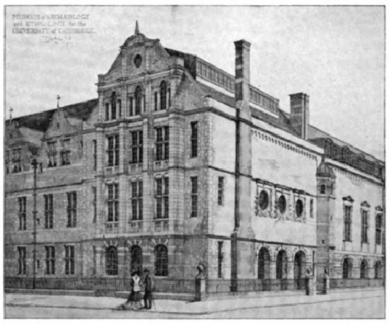
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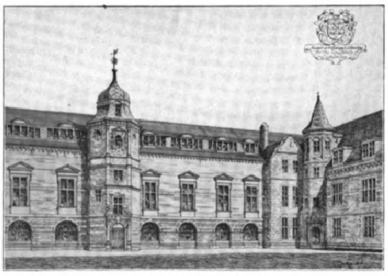


28. PORTRAIT OF BARON A. VON HUGEL.

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29–30. TWO VIEWS OF THE NEW CAMBRIDGE MUSEUM.

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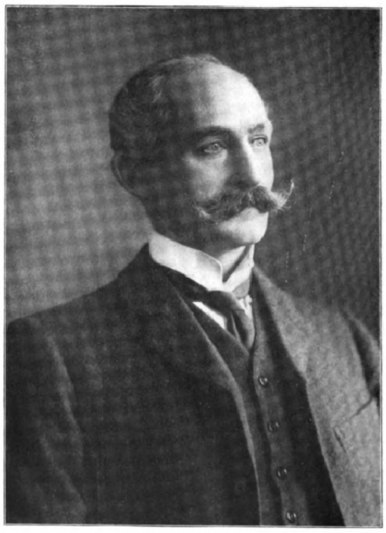
many of the doubtful specimens. None but an ethnologist can fully enjoy the pleasure of finding a parallel to some rare specimen long supposed unique, or specimens scattered through this and that museum, seemingly disjointed, brought closer together by some newly found intermediate form that clearly gives the key to that disjointed puzzle. Dr. Haddon had joined us in the little room that I remembered well from my earlier visit in 1896, and with these champions one fortification of ignorance after another fell before the assault.

Here the Fijian matters are by no means the whole, although the lists in the appendix will show their abundance. The Tongan clubs we saw rivalled only by some of Captain Cook's specimens at Sydney and Wellington, and the other portions of Polynesia were well represented. After a pleasant luncheon in the Faculty room in St. John's College Dr. Rivers took us through the library where we enjoyed many rare and beautiful illuminated manuscripts and early Caxtons and other bibliographical treasures. Later we dined in Hall at Christ's College the guests of Dr. Haddon, and met many distinguished Professors. It was no small pleasure to see the portrait of Charles Darwin, a graduate of this college, which hung on the wall behind my seat and above my head. The students at the long tables were a fine orderly body, and the custom of Latin grace before the meal and a social meeting of professors and guests in an adjoining room for coffee after were pleasant features. Professor Alfred Newton, the genial ornithologist and teacher, had on a former visit offered me coffee in his hospitable abode in Magdalene College, and after showing his treasures in the Natural History Museum, opened for me the remarkable library of Mr. Samuel Pepys, of which he was keeper, where I longed to spend many days. In the interval Professor Newton has passed away. He was chairman of the committee publishers of the Fauna Hawaiiensis.

In the little churchyard near the museums the widow of Captain Cook lies buried. [179]

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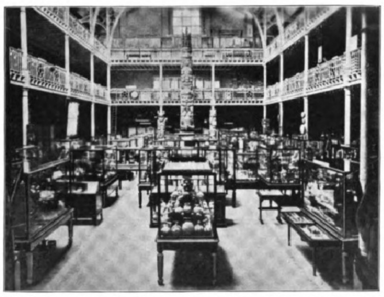


31. PORTRAIT OF PROFESSOR BALFOUR.

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Oxford was another Mecca of our pilgrimage. In my former visit in 1896 I had been the guest of Professor H. Balfour, and the friendship then formed with that distinguished ethnologist was pleasantly refreshed when he met us at the station on May 24th with his carriage. He took us first to the museum (Fig. 32) where we found many changes and additions, the latter especially in the



32. INTERIOR OF OXFORD MUSEUM.

collection of ethnic musical instruments. As is well known the Pitt-Rivers collection forms an important part of this museum, and the arrangement is comparative, hence difficult to enumerate. The result is vastly instructive, but only to be adopted in an extensive museum like the present. Among the exhibits was a fine series of pump-drills, also many choice Fijian lotus clubs.

The system adopted in the Oxford Museum is as follows: (Of course the smaller subdivisions are in practice greatly extended.)

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Principal Groups of Specimens.

I. PREHISTORIC.

Grouped by period.

- *Paleolithic period:* British Islands, France, Egypt, India, Africa, Tasmania (recent).
- *Cave period.*
- *Kitchen middens*, ancient and modern.
- *Neolithic period:* British Islands, France, Swiss and Italian lakes, Italy, Greece, Scandinavia.
- *Stone cells* (axes and adzes) in geographical and morphological groups.

Grouped by form and locality.

- *Hammer-stones, pounders, rubbing-stones, etc.*
- *Cores and flakes, worked-flakes.*
- *Scrapers.*
- *Knives, lance-heads, etc.*
- *Arrowheads.*
- *Manufacture of stone implements, methods used.*
- *Natural forms.*
- *Modern gun-flint making.*
- *Forgeries.*
- *Hafting of stone and shell implements.*

Use of bone, ivory and horn in manufacture of implements.

Bronze age.—

Age of copper.

Age of bronze: *Celts (development of forms), knives, razors, chisels, daggers and swords, spear-heads, arrow-heads, mace-heads, rings, etc.*

Iron age.—

Early axes and adzes, spear-heads and arrow-heads, swords and daggers.

II. ARTS OF LIFE.

War and the chase: *Clubs; boomerangs; spears and lances; instruments for throwing spears; arrows, quivers; bows, cross-bows, bullet bows, blow-guns; archer's arm-guards, bow-string pullers; many-pointed spears; harpoons; slings, bolas; axes and adzes; halbards; glaives, swords, daggers and knives; fighting-rings (cestus, etc.); fire-arms. Defensive arms: Parrying-sticks and shields, body armor, helmets.*

Food: *Fishing appliances, traps, agricultural implements, grinding mills, cooking utensils, strainers, etc.*

Fire making (domestic and ceremonial): *Illumination (lamps, candles, torches).*

Pottery: *Hand-made pottery, wheel-made pottery; substitutes for pottery.*

Clothing: *Covers and garments, head gear, foot gear, umbrellas and sun-shades, fans and fly-whisks, spinning, string-making, string and net-work, weaving; basketry; bark-cloth.*

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Locomotion: *Wheel and other transport; skates and snowshoes; navigation (boats, ships, paddles, etc.); horse gear (harness, bits, shoes, spurs, stirrups); whips and flagella; staves; cradles and baby carriers.*

Domestic appliances, etc.: *Tools (cutting, drilling, sawing, rasping, etc.); spoons, forks, knives; locks and keys; measures of weight, time, etc.; currency; writing and primitive records; dwellings; head-rests; surgical appliances; medicine; metallurgy (bronze and iron).*

III. ARTS OF PLEASURE.

Personal adornment: *Toilet gear, mirrors, combs, cosmetics; tatuing; artificial deformation (head, lips, ears, nose, feet); hair and hair dressing.*

Personal ornaments: *Ornaments of shell, bones and teeth of animals, vegetable substance; armlets and leglets; belts and sashes; pouches, beads and beadwork; feather work; torques; rings; penannular rings; fibulae; ring brooches; pins; cloak fasteners.*

Tobacco and hemp smoking, etc.: *Narcotics and stimulants.*

Musical instruments: *Percussion (rattles, gongs, bells, drums, etc.); wind (syrinx, whistles, reed instruments, trumpets); stringed (musical bow, harps, zithers, dulcimers, guitars, fiddles, etc.); masks (dancing, ceremonial, dramatic).*

Art: *Graphic and plastic art; development of ornament and patterns; animal form in art; human form in art; zoomorphic, phyllomorphic designs; geometric patterns; loop, coil, and fret patterns; influence of textiles on designs, etc.*

IV. MAGIC AND RELIGION.

Magic, sorcery, etc.; divination; primitive religion; oriental religions; ex votos; treatment of the dead; war trophies.

V. CEREMONIAL IMPLEMENTS.

A very interesting Hawaiian idol is in this museum; the inscription states that it was given to the Ashmolean Museum by the Rev. Andrew Bloxam, M.A., Worcester College, Oxford, in 1826, and from there it came to the Pitt-Rivers Museum. It is 33.6 inches high and was obtained from the Hale o Keawe at Honaunau, Hawaii, at the time of the visit of the Blonde, on which Bloxam was chaplain. Fig. 33.

As at the younger university the library was not passed by, and the Bodleian delighted us with its treasures—antiques in a suitably ancient setting. We were also taken to see the boat races,

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rs were not less an interesting study than the athletic contestants. The view of the town of Oxford from the upper windows of the Balfour villa at Headington Hill in the early morning was most attractive.

where ten eight-oared crews contended, and we were privileged to see a "bump" directly opposite the college barge where we were seated. The spectators were not less an interesting study than the athletic contestants. The view of the town of Oxford from the upper windows of the Balfour villa at Headington Hill in the early morning was most attractive.

In the direction of the Sydenham Crystal Palace from London at Forest Hill there is a quaint museum building bearing the following inscription on a bronze tablet:

> Founded in 1890 by Frederick John Horniman, Esq., M.P., F.R.G.S., F.L.S.; rebuilt in 1900; and, in 1901 presented by him, with the adjoining Horniman-gardens, to the London County Council, as a free gift to the people, for ever.[1]



33. BLOXAM IDOL, OXFORD MUSEUM.

To the original museum a lecture hall and library has been added by Mr. E. J. Horniman, son of the founder, which was opened to the public January 27, 1912. Fig. 34.

In several respects this museum differs from all others seen, and having had the great advantage of the knowledge and faculty of arrangement of Dr. A. C. Haddon, it may well occupy some space for its description. In the first place it is open free every day in the year except Christmas. Sundays, all the year round, 3 p.m. to 9 p.m. Week days, April to September inclusive, 11 a.m. to 8 p.m.; October to March inclusive, 11 a.m. to 6 p.m. The main building consists

[1] To that Council I am indebted for the photographs used in illustration, and a full set of the exceedingly well-arranged handbooks.

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of two galleried halls at different levels, with a broad corridor extending along the eastern side. Each hall is 100 feet long by 47 feet wide, while the balconies are only 6 feet wide, except at the northern end in each hall, where the width is much greater. The whole building is 258 feet long by 61 feet wide, and there is a clock tower about 100 feet high. As seen in Fig. 37, the lecture room and library is on the left side of the museum building, of which it forms part. The contents of this building, or rather their admirable arrangement, constitute the individuality of the institution: they are grouped on the evolutionary or development system, both for animals (in the North Hall, Fig. 35) and for the works of man (in the South Hall, Fig. 36). To aid the visitor are, beside the arrangement, a series of handbooks costing from one to three pence as follows:

1. Guide for the use of Visitors to the Horniman Museum and Library. 2½ pence.

2. Handbook to the Collection arranged as an introduction to the Study of Animal Life.

3. Handbook to the Vivaria and Fresh Water Aquaria.

4. Handbook to the Marine Aquaria. (With 2 plates.)

5. Handbook to the case arranged as an Introduction to the Study of Birds' Eggs. (6 plates.)

6. Handbook to the Library. 3 pence.

7. From Stone to Steel: a Handbook to the cases illustrating the Ages of Stone, Bronze and Iron. (2 plates.) 3 pence.

8. Handbook to the Weapons of War and the Chase. (2 plates.) 2 pence.

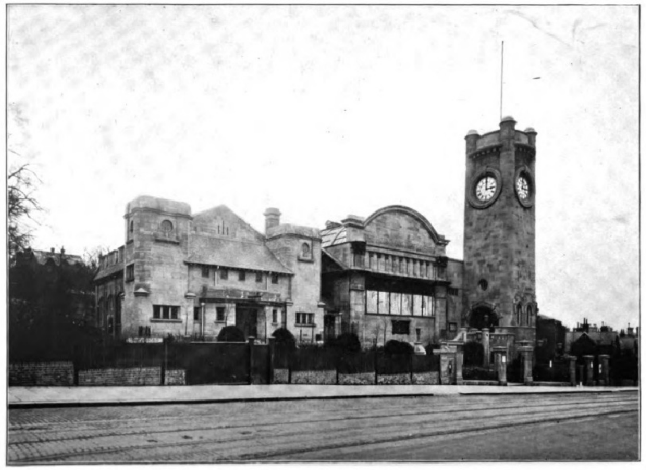
9. Handbook to the Cases illustrating Stages in the Evolution of the Domestic Arts (Part I). Agriculture, the Preparation of Food, and Fire-making.

10. Ditto. Part II. Basketry, Pottery, Spinning and Weaving. (2 plates.)

11. Handbook to the Cases illustrating Animal Locomotion. (1 plate.)

I copy from page 24 of the Guide:

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34. HORNIMAN MUSEUM, LONDON.

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35. INTERIOR OF SOUTH HALL.

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"Natural and Artificial Vessels.

(Centre Cases.)

"The first vessels used by man were no doubt natural receptacles such as shells, cocoanut shells and gourds. Sections of bambu, and the horns and skins of animals, require a little more preparation, whilst vessels of bark, wood, and stone are only of natural origin as regards the materials of which they are made. Baskets and earthenware pots were no doubt of relatively late date, and vessels of metal and glass are scarcely known outside civilization. The museum collection contains representatives of all the above-mentioned classes of vessels, in each case chosen from as wide an area as possible.

"GOURD VESSELS (often called "calabashes"): from Oceania, Africa, Burma. The specimen from New Caledonia (West Pacific), with protective net of coconut fibre string, is worthy of notice.

"COCONUT VESSELS: Oceania, Africa, Ceylon, Japan. Some are enclosed in a suspending net of string or sinnet.

"BAMBOO VESSELS: from British New Guinea and Burma.

"SHELL VESSELS: (the shell of *Cymbium*) for cooking, from Torres Straits Islands (between Australia and New Guinea).

"HORN VESSELS: ox-horn cups, South Africa and Argentina, and an Anglo-Saxon specimen found in London; horn ladle, Haida Indians of North America; old English horn beakers.

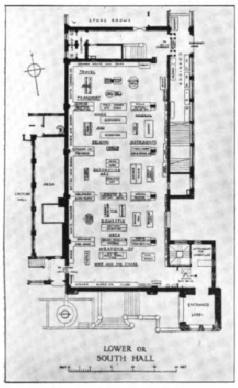
"SKIN VESSELS: goat-skin water bag, Cairo; walrus bladder bucket, Siberia; Spanish peasant's skin bag for wine or water; hide bottle for cuscus, Kabyles of Algeria; food vessels of wood and hide, East Central Africa; hide bottle, Hausa of Northern Nigeria; old English "black-jacks" and "leather bottles."

"BARK VESSELS: bark dish for fish, Ainu of Japan; birch-bark tray, North American Indians.

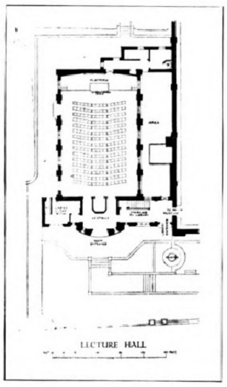
"WOODEN VESSELS: (1) *Carved in one piece:* from Australia, the Pacific islands, North America, Africa, Japan (Ainu); old English platter, and old Norwegian beer bowls. (2) *Built up of several pieces:* cedar wood boxes, north-west North America; wooden bucket made of two pieces, Eskimo of Alaska: old English harvest barrels, old Norwegian tankards."

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It is pleasing to know that the attendance at this museum is very good. For 1911, 167,502 persons visited the place, or a daily average of 460. Three courses of lectures to teachers are given on Saturday mornings, while on Saturday afternoons courses of more popular interest are given in one of the rooms. As an illustration



36. PLAN OF SOUTH HALL.

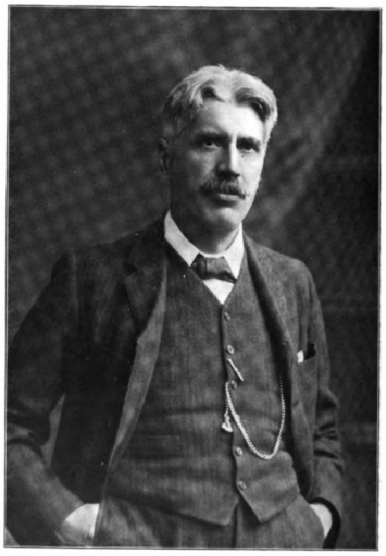


37. PLAN OF LECTURE HALL.

of the first courses to teachers here is the Twenty-fourth course for the Winter term: Phases of Animal Life, by H. S. Harrison, D.Sc. (Lond.), A.R.C.Sc. The Simplest Animals; Division of Physiological Labour in Higher Forms; The Procuring of Food: Offence and Defence; Evasion and Concealment; Modes of Reproduction; The Development of the Individual; Domestic and Social Life;

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38. DR. A. C. HADDON.

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Partnerships and Parasitism; Progress and Degeneration. The Twenty-sixth course for the Autumn term was by Dr. A. C. Haddon, F.R.S.: Why and How we study Mankind. The reasons for studying our Fellow Men; Observations on the Living: The Study of Skulls and Bones; Psychological Investigations and Sociological Methods; The Investigation of Ideas and Ideals: The Distribution of Arts and Crafts; The Methods of Archæology; The Teachings of Folklore; The Decorative Art of British New Guinea—A Study in Method.

The course of popular lectures for the Winter term, Saturday afternoons, was by varions lecturers on the following subjects: Animals in Primitive Art; Coal, what it is and what it yields; Japanese Architecture and Garden Craft; The Structure and Uses of Hair; The Educational Value of Children's Toys; Plant Hybrids; Native Life in Central Africa; The Structure and Uses of Teeth; The Origin and History of Bells; The Plant Life of a Pond. Surely the teachers in this neighborhood are favored, and not less are the children and older learners.

There is an element of bitter disappointment in such a journey as ours, that the volumes we were continually opening and reading as it were the title page and perhaps the table of contents must be relinquished for others awaiting the same brief notice as we hurry on. In both public and private museums of Great Britain we might have spent most of our allotted time in study, although as we passed on to the continent we found perhaps more modern buildings and better instalment; with no more material I am inclined to think the material at hand was better treated, especially in the ethnological side in, say the new museums of Germany, and the United States. Be this as it may, I am certain that I found more suggestions in the housing of specimens in Cologne, Leipzig, Frankfurt am Main, etc., than in England. We regretted to leave unvisited many of the smaller museums in various cities and towns throughout Great Britain.

On May 27th we left Harwich at 10 p.m. for the Hook of Holland, arriving at the Hague at 6:30 the next morning. We were joined on the train by a young Dutch friend, Mr. Willem Kast Sypestein, Jr., who has been pursuing his post graduate studies at Delft, and he proved all through our stay in Holland a

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most agreeable and useful guide and interpreter—we often, while traveling in Java, wished for his presence. He introduced us to his Professors, and thus we were able to see the laboratories and have a most profitable day at Delft.

Leiden and its great Rijks Ethnographisch Museum we had looked forward to with our excursion to Java in mind, for I well remembered the rich stores of Javanese products which I had rather slighted for want of time on my last visit. The town was much the same and our hotel almost unchanged. The old museum was externally the same, one of a block of buildings, and within was the familiar superabundance of oriental specimens, but the Pacific collections had been removed to the other end of the city, to a private house (or houses) opposite the Rijks Museum van Natuurlijke Historie.[1] The maps of Java (especially prepared for some great exposition), Javanese costumes, musical instruments, and models of houses, boats and machinery claimed much attention, but I could not see that the danger of fire had been eliminated, and indeed as we left the building a fire broke out in a neighboring shop, and we had an

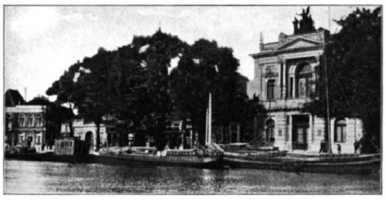


39. DR. H. H. JUYNBOLL.

[1] While a Frenchman, Jomard, was perhaps the first to publicly suggest the idea of a museum of Ethnography, it was in the town of Leiden that the matter assumed a concrete form when the authorities obtained the remarkable collections made by Philip Franz von Siebold in Japan. Siebold was a Hollander, and in a letter to his friend Jomard (*Lettre sur l'utilité des Musées Ethnographiques*, Paris, 1843) he points out that he had already taken steps both to adopt and improve on the idea of the French geographer; his attention had been turned to the need of following up every trace of the origins of peoples and their early migrations, by a comparative investigation of their customs, forms and cult. Jomard never realized his dream, but his last published work ends thus: "qu' on ne songe guère à ce musée de la géographie et des voyages longtemps espéré, vainement attendu......bien que l'utilité en soit incontestable." It was to a visit to this Leiden collection that Thomsen owed much of his inspiration with which he made the Danish Ethnographical Museum long the chief in Europe, and its place is still high owing to the work of his successors, Worsaae and Muller. (*Fortale til Kataloget over det Ethn. Museum, 1862.*) [192]

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opportunity of seeing the *Brandspuit* come to the rescue—a sight that did not strengthen our belief in the safety of the fine collection in the present building. In the new quarters the conditions seemed better; there were fewer shops, none close at hand, and there



40. TEYLER'S MUSEUM, HAARLEM.



41. MUSEUM VOOR KUNST EN NIJVERHEID, HAARLEM.

was more room and of course better arrangement. Dr. J. D. E. Schmeltz, so valuable a guide on my former visit, was no longer living,[1] but his son Mr. J. C. E. Schmeltz was an assistant in the museum, and the new Director, Dr. H. H. Juynboll (Fig. 39), and

[1] A portrait of the late Dr. Schmeltz and a bibliography of his many contributions to Ethnology are published in Internationales Archiv für Ethnographie, Band xviii, 1910.

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Conservator H. W. Fischer did everything to facilitate the examination of their many treasures.

Passing through Haarlem we were fortunate enough to hear a recital on the great organ:[1] these are given once a week by skilled organists, and it spoke well for the taste of the people of Haarlem that the large church was filled by an attentive audience. In the Museum van Kunstnijverheid (Art Industries, Fig. 41) was a good collection of the peculiar method of printing cloth known in Java as

735-38 by Christopher Mullerand restored in



42. RIJKSMUSEUM, AMSTERDAM.

batik, which will be described when we come to Java in the course of this mission. At Haarlem there is also the Teyler's Museum of Art and Natural History, of which the new wing (Fig. 40) faces the river Spaarne with an imposing façade. The building of these two museums in this beautiful town shows what can be done in this line by the people of Holland, and with such examples it is strange that the Government museums in Leiden are not better housed.

In Amsterdam of course the Rijksmuseum was visited with delight and profit, although no ethnological collection was there; the arrangement of Rembrandt's Night Watch, the central attrac-

[1] This organ was built in 1735–38 by Christopher Muller and restored in 1868. It has 3 keyboards, 64 stops, and 5000 pipes. While no longer the largest it is still one of the finest. [194]

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tion, has been greatly improved, and other departments, especially the architectural casts, have been made more accessible. The Colonial exhibits seem to have been divided between Haarlem and Amsterdam. We turned for the ethnological collection to the garden of the Koninklijk Zoologisch Genootschap, "Natura Artis Magistra" (founded in 1838 and now 28 acres in extent). I have spoken of this very excellent institution in the heart of Amsterdam in my report of a former visit, and I need only add that the



43. THE NATIONAL MUSEUM—PRINDSENS PALAIS, COPENHAGEN.

macaws or their successors still hang on either side of the principal avenue of approach; the animal houses are as well cared for, and the trees and shrubs have grown into almost a forest, in which we had some trouble in finding the ethnological museum. While this is mostly oriental we found some specimens from the Pacific, as will be noted in the sequel. In adjoining buildings we found good groups of mounted birds (water fowl, etc.), and the model houses and carts were capital. It may be added that in the grounds are fish hatcheries from which the Dutch rivers are annually supplied, also a small incubator, and an aquarium.

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44. DR. SOPHUS MÜLLER, DIRECTOR.

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Sunday, June 2nd, we left Amsterdam at 8 a.m., arriving at Hamburg late in the afternoon. The Ethnographic Museum had been removed from the attic where I saw it last and had a new home as well as a new Director, Professor Doctor G. Thilenius. The building was certainly imposing externally, but we only saw the contents of the former museum piled on the floors of the as yet unarranged chambers. When we visited this building we were courteously shown all that could be seen, but unfortunately for us there was some colonial congress in session in the audience hall which seemed the only finished portion of the fine building, and Dr. Thilenius was engaged: I had hoped to congratulate him on the new quarters but was disappointed. The *Deutsche Gesellschaft für Anthropologie, Ethnologie und Urgeschichte*, to whom the museum belongs, was founded in 1870 and publishes *Archiv für Anthropologie* (since 1866), *Correspondenzblatt* (since 1870), *Prähistorische Zeitschrift* (since 1909). The old building in the Stein-Tor-Wall was still occupied by the Natural History Museum, which has very large collections but at present is rather crowded. It was noteworthy for many excellences; the skeletons of the animal were often placed by the side of the mounted skin; the human skeletons of various races were of great interest, but as an extensive rearrangement was in progress (the museum was closed to the public) it would hardly be worth while to describe the collections more fully. As might be supposed, Hamburg is well situated for a museum of natural history, and it was a matter of deep regret that we could not have seen both of these museums at their best.

We found that there was now an organization by the "Freie und Hansestadt" Hamburg including most of the higher scientific institutions called *Wissenschaftliche Anstalten des Staates Hamburg*, which took charge of the publication exchanges, and which, as I understand, has erected the building occupied in common by the chief collections of a scientific character in Hamburg. I was sorry not to have time (within open hours) to see again Dr. Justus Brinckmann and his fine collection in the *Museum für Kunst und Gewerbe.* A short drive through the residential portion of this great and prosperous free city disclosed many very beautiful private residences certainly more attractive than any palaces I saw. My friend Dr. Edw. Arning, well known on these Hawaiian Islands

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for his investigations on leprosy, and who had been my guide on a former visit, was unfortunately absent, but I had the pleasure of greeting his cousin, one of the most distinguished physicians of Hamburg. The Zoologische Garten and Aquarium we did not have time to visit.

Our passage to Copenhagen, our next halting place, was much more agreeable than it was fourteen years ago. The rather uncomfortable little ferryboat had been replaced by a boat for our train from Warnemunde, making the passage most comfortable. We found pleasant quarters at the hotel, and the advance in sanitary matters was most pleasing. Of course the Nationalmuseet in the Prindsens-Palais on the Frederikholms-Canal was our Mecca, and there we found the Director, Dr. Sophus Muller, the distinguished antiquarian and ethnologist, who gave us every facility for our study of the collections in his care, so that we made more than one visit to this museum. We found in the courtyard of this old palace a prehistoric tumulus and also casts of others most interesting. The green feather cape (Fig. 46) we were especially looking for was rather disappointing, as it had faded considerably since my last visit; however, we had every facility for examining the collection, and listed more carefully than was possible on my former visit the Hawaiian collection,



45. RUDE HAWAIIAN IMAGE.

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which is far better than most museums can show, largely, I believe, through the contributions of Steen Bille[1] and his nephew Mr. Steen A. Bille who called on us, and formerly lived on Maui.

In the same building is the *Danske Samling*, a very interesting collection containing much from the Danish *Kjökkenmöddinger*,



46. HAWAIIAN FEATHER CAPE.

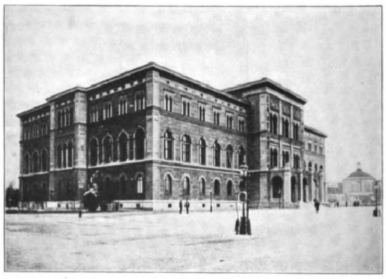
or "kitchen middens" on the Danish coast. The third division contains antiquities, Egyptian, Assyrian, Etruscan, etc., not of much importance.

Of course, while we were chiefly engaged in the Ethnological Museum, we did not fail to visit the grand Thorwaldsen Museum

[1] Beretning om Corvetten Galathea. Reise omkring Jorden 1845-47. Copenhagen, 1849-51. 3 vols. 8vo. Maps and plates. Arrived at Honolulu Oct. 5, 1846, and left Hilo Nov. 16 of the same year. This voyage was translated into German, 2 vols. 8vo., and a portion translated into English by Mr. F. Banning late of Honolulu. The Friend, Jan., 1863, et seq.

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and the Vor Fruekirke (my earlier visit to this collection of the great Danish sculptor's work was late in the day and the light was dim; now it was perfect, and I enjoyed "the company of the saints" fully). In the museum there were too evident marks of decay about the building. I do not recall another city so endowed with a collection of the works of a native master, and Copenhagen cannot afford to allow even the appearance of neglect in this temple



47. NATIONAL MUSEUM, STOCKHOLM.

of sculpture. The new building of the Ny.-Carlsberg Glyptothek near the railway station we had not time to visit, although the remembrance was fresh of a former pleasant inspection when the munificent gift to the city was in less imposing quarters. Springtime in these northern cities is always, to me, the best season, and we were in no hurry to leave Copenhagen where we had found so many things to interest and instruct us, but like the Ancient Mariner we were obliged to move on, and indeed the way on was very attractive; the ferry to Malmö, and the day's journey through the lake region of Sweden was very enjoyable, and it seemed a fitting close to so pleasant a day when we came to the island city

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of Stockholm and were set down at a commodious hotel with an outlook over the harbor to the royal palace beyond. The beauty of this fine northern city was enhanced by the delightful spring weather, and the June days were at their longest—more hours of daylight for our work than either of us had ever seen before. Perhaps the city was in gala-day attire for the approaching Olympic games, but certainly I never saw a cleaner city.



48. OSCAR MONTELIUS, DIRECTOR.

While the Royal Palace was right in front of our window balcony, a building of more importance, to us, was across the channel to the left, the National Museum. It was a short walk from the hotel, and on the way we came to the masterpiece of the Swedish sculptor J. P. Molin, a bronze group of the *Bältespännare* (belt duellists), where the combatants were bound together by their belts and fought out their quarrel with knives, much as the Australians of the present day fight with stone knives. The sad tale is told in four reliefs on the pedestal. A few steps beyond is the museum (Fig. 47) completed in 1866, and within the entrance stand, very appropriately the old Scandinavian gods Odin, Baldur and Thor. I do not know of a more complete object-illustrated early history of a people than has been assembled here. The present Director, Dr. Oscar Montelius, is well known through the scientific world as a most worthy suc-

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cessor of the distinguished men who have brought together this vast collection. I found it most instructive to compare the stone work of our Pacific tribes with that of the men of the north. Our tropical men had no metal, so the comparison stopped at the Iron Age. We were greatly pleased with the picture galleries, which contain much work of the native artists; the landscape work offering especial attraction. As in all the northern museums there is



49. NORDISKA MUSEET, STOCKHOLM.

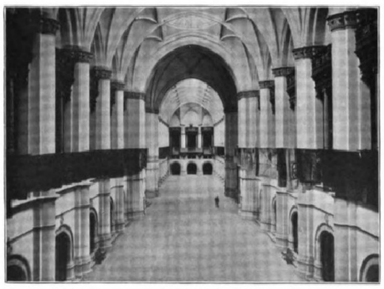
perhaps less danger to the specimens from insects than to the visitors from cold, and the preparations were almost in the nature of a fortification against the powers of Ice and Frost.

Another great museum is in full view from this but separated by one of the many water channels of this northern Venice. In the Djurgards Staden rises the stately Nordiska Museet, and all around are places of instruction and amusement. Open air theatres where the native dances may be seen; the Biological Museum where are native animals in instructive groups and surroundings; a Circus and other places for relaxation. Towering over all these is the Nordiska Museet, where the Scandinavian history, of which the early chapters were in the National Museum, is continued

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through later ages. The many rooms in which are shown the home life of the peasantry and the lords of the land are most interesting, and we were fortunate in having an excellent guide.

The great hall shown in Fig. 50, is now partly filled; the galleries on both sides contain the rooms of home life, collections of implements of both indoor and outdoor life in Scandinavia. Dr. Artur Hazelius is, I understand, the founder of most of this



50. INTERIOR OF NORDISKA MUSEET.

great work. When we can, if ever, put in one building so clear and complete a story of the Polynesian civilizations—but we are perhaps too late to equal the completeness of this object lesson.

In a street leading out of the Drottning-Gata, is the Geological Museum with a good collection of Swedish economic rocks. Not far from this is the Wetenskaps-Akademi, or Academy of Science, founded in 1739, of which the first director was the great Linnæus. The building contains a valuable natural history collection. Stockholm seems to be well provided with live and instructive museums. The Nordiska Museet has a very complete system of disinfection, or fumigation, including a vacuum chamber, large

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enough to enclose any ordinary furniture, and power pumps. The instalation is very complete with all the necessary gauges and conveniencies for introducing the disinfectant. Of course this is not only more effective but shortens the time of exposure: in the tropics such methods are very desirable, as it is not easy to reach termites and other deeply imbedded grubs without an unreasonably long exposure.

The Scandinavian museums are rich in material of the Stone Age, and perhaps nowhere else is this material better studied. We found nothing in the central European museums surpassing the collections here. On June 11th at about the sixth hour of the afternoon we boarded the good steamer Torneå of the Finland line and began a three day's voyage to St. Petersburg. To our astonishment we were hardly out of sight of land all the voyage; the granite rocks capped with pines were always on one side if not on both. A short stop at Helsingfors, but so late in the day that we did not go ashore beyond the pier. It would have been pleasant to have carried with us many of the neat and attractive things we found on that steamer!

Up the canal and right into the city of Peter the Great; not the least trouble with the Customs, and we were installed in most comfortable apartments in the Hotel d'Europe and were soon ready to partake of our first Russian meal. That it required some time to get used to the new surroundings can well be imagined, but St. Petersburg is a cosmopolitan city and here, more than usual, everybody seemed ready to help strangers instead of trying to plunder them. The city was very attractive, but our work had to be attended to and our first disappointment was to find the natural history collection connected with the University closed for the summer; later we found entrance and were greatly pleased with the collections; the deep sea specimens were especially well displayed, both the lower forms and the great mammals. The Ethnographic Museum was connected with the Academie Imperiale des Sciences, of which I had the honor to be a corresponding member, and I found Dr. Wilhelm Radloff, the Director of the Ethnographic-Anthropologic Museum of Peter the Great, which is one of the numerous scientific institutions connected with that great academy, ready to assist us in every way. We had been

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lured to this northern capital largely by the remarkable collection of Pacific specimens given by the surviving officers of Cook's vessels to the Governor of Kamchatka in acknowledgment of his kindness in furnishing the expedition with much-needed supplies. These presents had been forwarded to the Russian Government and lost in the Government storehouses for more than a century (much as the collections of Vancouver's expedition had been lost in England) and only two or three years ago brought to light. As I have been promised photographs of the more important objects, I will say but little of this collection here, but hope to publish with other documents an account of the genuine Cook relics in this and other museums on which we have made notes in our journey. It is perhaps fitting that here, where the great navigator met his death, his memory should be recalled in an exhibit of the trophies his ships brought home and his Government allowed to be scattered through museums, both public and private, until few remain in his own country.[1]

The Imperial Academy has many branches and museums: the Library, founded in 1728, contains 500,000 books and 13,000 MSS.; Archive Department contains the correspondence, records, and publications; a Printery; Physical Cabinet; Physiological Laboratory; Zoölogical Laboratory; Laboratory for Plant Anatomy and Physiology; Biological Station at Sebastopol; Seismic Laboratory; Russian Bureau of International Bibliography; Central Physical Observatory (founded in 1849), and of museums besides the Ethnographical already mentioned, Asiatic Museum; Coin Cabinet; Geological Museum of Peter the Great; Botanical Museum; Zoölogical Museum; all under separate directors and with full staffs of distinguished scientists. I have found nowhere so broad an organization of an academy of sciences. The Zoölogical Museum deserves a longer notice, but in brief it is divided into two parts more distinct than usual, the collection open to the public installed in two large halls, where the labels are printed in Russian and Latin, the animals found in Russia having red labels; and the scientific collection, open only to competent students. Of the remarkable specimens are the skeleton of a whale (*Balæ-*

[1] Unfortunately I neglected to make sketches of the Hawaiian things as the Director promised to send me photographs of the whole collection, as well as specimens of the many fine kapa sheets, none of which have arrived as yet.

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noptera sibbaldii) 31 m. long; skeleton of the extinct sea cow (*Rhytima gigas*); remains of the mammoth and other extinct animals including not only the skeletons but the hide and hairs and even the flesh of the mammoth well preserved in the ice of northern Siberia. The Botanical Museum contains the collections of Steller, Pallas, Gmelin, Prjevalsky and other distinguished explorers.

The Ermitage, in many respects the finest art collection in the world, and one of its strong points is the absence of poor or mediocre works, was closed not only for the summer but for much-needed repairs; but, thanks to the Hon. Curtis Guild, American Minister to Russia, and to General Tolstoi, within whose province this work belonged, we were not only permitted to enter, but the gentlemen in charge, all of whom spoke French, showed us all that could be seen, even opening the covered cases and calling attention to matters we might easily have passed in the abundance of objects of great interest. The Empress Catherine was early in the field and had taste as well as money. The palace of Count Stroganoff was another place where we were kindly permitted to enter and examine, what I had for many years desired to see, the Stroganoff Apollo. The Museum of Alexander III contained a very attractive gallery of paintings which I would often visit were I a resident of St. Petersburg. The collections at Tsarskoié-Sélo were another great enjoyment. Not less than the museums the Russian churches attract the visitor, and in costly architecture, gorgeous decoration, and impressive ceremonies of the Greek Church, both at the capital and the more distinctly Russian city Moskau, seemed to far surpass anything of the kind I have ever seen of Rome's proudest pageants.

From St. Petersburg to Moskau was a night's journey in very comfortable sleepers. In the morning our impressions from the station to our hotel were not agreeable, for we passed through a poor part of the city, but we were not long in gaining other and far pleasanter views of this fine and picturesque city. In our hotel we were almost under the Kremlin, that wonderful aggregation of churches with polychrome roofs and gilded domes filled with matters of interest from ikons to coffined Tzars. In the principal church we heard mass performed by the Archbishop of Moskau,

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51. ROUMIAHTZEFF MUSEUM.

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52. MUSEUM IN THE PARK, BUDAPEST.

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and the grand music of the great choir of men and boys, unaided by instrument, was more impressive than any organ. There are no seats in Russian churches, and when I stood for more than an hour and a half in the midst of the most democratic congregation I ever saw in a church, without weariness, there must have been something in the service, of which I understood not a single word.

The beautiful museum on the hill (Fig. 51), built of white marble, was one of the most imposing museum buildings we saw in any city, and the contents were worthy of the temple. As is common in the Russian municipal museums archæology and ethnology are found in museums mainly devoted to painting and sculpture, and for most visitors the latter totally eclipse the former.

The palaces also were museums filled often with tragic memories, but the ethnology of the streets was often better worth study. Western and Oriental, high and low, passing in a way even more interesting than in the cosmopolitan crowds of Honolulu. Even the carts were more various than seen elsewhere, and an attempt to gather pictures of all these was at length abandoned as time did not allow.

When we left Moskau our way was no longer comfortable and direct; we had rather crooked lines and crowded cars until we passed into Hungary, and after a fine mountain ride in the early morning came to the most beautiful city we had seen, Budapest on the banks of the Danube. Museums of art had been abundant in Russia, but our chief ethnological one was in St. Petersburg. Here in Budapest were museums of every kind from the touching Memorial Museum of the murdered Empress Elisabeth in the upper rooms of the Imperial Palace on the heights of Pest to the very complete Museum of Transportation in the park in Buda. To describe them all would require a larger volume than this report can reach, but there are two in the attractive park under one roof that come into our line, one for ethnological interest, the other for its thorough organization and completeness. The Museum of Ethnology, Fig. 52 (I omit the Magyar title), shows the Hungarian peasant life in a way that almost takes us back to Polynesian beginnings. The agricultural implements were often very primitive but not the less interesting on that account. Often whole rooms of country houses were presented with their occupants in

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modelled figures showing costumes cotemporary. There were also good ethnological specimens from other parts of the world. New steel cases were being installed. The Director was absent, to our regret, but we were shown all that we desired to see. The whole method was much like that in the Nordiska Museet in Stockholm.

On the other side of the building was a museum we had nearly passed, but the open door gave us a glimpse of some machinery and we entered more from curiosity than in expectation of gathering information on museum matters. I am going to describe the contents more fully because they were so different from what we had examined hitherto, and in the end because of the completeness of the plan and arrangement.

MUSEUM OF TRANSPORTATION, BUDAPEST. JUNE 28, 1912.

This museum is well housed in the People's Park, and perhaps owes its existence to the admirable preparation of models for one of the great expositions since 1896. It is the most complete collection of everything contributing to the work of modern transportation by land or water that I have ever seen, nor do I recall any collection of modern implements and processes so complete; it is what I believe a museum should strive to be in any department. To enumerate all the exhibits (and I do not know that there is any printed catalogue, and if there were it would doubtless be in the Magyar language) would be out of the question, but it may be said that they began with the raw material, whether animal, vegetable or mineral, and presented all the important stages from the moment they were taken from the general pile and directed to their future niche as factors in the transportation problem.

Here were the woods used for building cars and furniture as well as those best fitted for sleepers or ties—both in cross and longitudinal section, in the rough and polished; steel, both rolled and cast or drop-forged, among these, portion of a plate burst by pumping in cold water to a nearly empty boiler when hot; piston rods and axles bent double when cold; a driving wheel experimented on after twenty years use by pressing in the rim so as to bend the spokes without a crack; a rail that had been cracked badly by a dynamite explosion and yet held together while a fast train passed over it. Then there were buffers and coiled springs of

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fine finish, plate springs and couplings; bearing boxes in section to show the oiling arrangement; rails joined with fish-plates and sections of the same; all the steel pins, keys and bolts; crank arms and throttle handles; all brass castings from whistle to pet-cocks, and these in neatly cut sections when this would better show the construction. Specimens of the coals used and the oils; even of the cloths used for the employee's uniforms, the covering of the seats, the towels in the washrooms, the carpetings for the floors; the bedding for the *wagon-lit* and the curtain for the windows. In hinged glass frames were specimens of all tickets used on the Hungarian roads and diagrams of the methods of punching them.

The arrangement of rails and switches, with working models of a switch opened by the passage of a train, and apparatus used to replace a derailed car; turntable with model of a locomotive to show how the table was moved, and clamped at the desired rails; another to show how the wheels were changed for a different gauge without disturbing the cars—a contrivance which seemed more simple than the cumbersome and costly contrivances used on the American roads when a shift was necessary to the former narrow gauge lines of the southern states, and *vice versa*.

Not less important, we were shown the operation of block signals and the recording of telegrams sent; the opening and closing of crossing gates from a distance, and the warning to approaching trains by danger signals. Of these there were many working models, all of which the obliging attendants put in operation for our instruction; older and now disused systems were also shown.

Then came carefully constructed models of bridges both for rail and common roads, most of them of bridges over the Danube at Budapest, among them the fine Elisabeth bridge of single span, but the humble culverts were not omitted, and we had an opportunity to see some of the actual specimens on the roads we traveled over.

Too much praise cannot be given to the scale models of all the various wagons, trucks or cars, both for freight and passenger service, finished as completely and perfectly as the vehicles in actual use; and among these models should be mentioned two—one made by a young man afflicted with curvature of the spine, every minute pipe and pin in the locomotive being beautifully finished—the other by

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a shepherd lad whose ingenuity and deft handicraft shown in the little locomotive obtained for him (it is pleasant to know) a good opportunity for education for which he had proved himself so fit.

Among the cars was a very complete "Pullman", and in the historical line a model of the first Hungarian-built locomotive. There was a fine link-motion model in working order with section of valve, valve-chest and cylinder.

Models of station houses, notably the one at Fiume, and car barns and other necessary constructions. Not only specimens of the stone used for platforms and culverts, but the concrete tubings for buried electric wires, and every form of insulators of the many used; tiles used for flooring, roofs and drains in the station houses, and for the same purpose brick, terra-cotta and majolica, all of Hungarian manufacture. Not to be forgotten was a working model of a locomotive that on meeting a steep grade picked up a cable and climbed on that hold, a contrivance much cheaper than the usual ratchet. I would not pass over the various lamps, both for car lighting and signalling, all of which, both oil and electric were well represented.

Farther on in the long and well-lighted hall we came to the travel by water, and here were beautiful models of the royal yacht with paddle wheels, river boats and ocean-going steamers, including the Hungarian-American liners, some of these in section to show the arrangement of decks and staterooms, etc. Models of sailing vessels full rigged and canoes from the Pacific with outriggers. All the modern life-saving outfits were of course present. At the end of the hall under an archway was seen a beautiful model of Fiume (the national port) and its breakwater seen over the bow of an actual boat. A relief plan of the Hungarian harbor and its breakwater was also given. Docks and canal locks; shears and cranes for handling freight were not forgotten.

An interesting exhibit was a plan and view of the work on the "Iron Gates" of the Danube, and there were working models of the various and curious craft used in this work from the preliminary measurement of the river bed, through the drilling the rock for the explosives, and the dredging and removal of the debris. Oh, if we had such a record of the building of the Pyramids, or even the more modest erection of Stonehenge!

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53. AGRICULTURAL MUSEUM, PARK, BUDAPEST.



54. INTERIOR OF AGRICULTURAL MUSEUM.

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There is an underground railway three miles long in Budapest of which the building was fully illustrated by diagram and model. This mention gives excuse for returning on our steps and picking up some more matters as we returned to the entrance. Air-brakes, lighting methods and ventilation were all fully illustrated, and on the walls were good paintings of the mountain railways and such other matters as could best be shown in that manner. It is not pretended that this brief summary does justice to the completeness and tasteful arrangement of the exhibits, but it may



55. HUNGARIAN NATIONAL MUSEUM.

convey some idea of the value of such a national collection to the polytechnic student as well as to the traveling public. I am almost afraid, from the eagerness with which the attendants met our evident interest, that the attendance of visitors is not as it should be. Almost in a postscript I must mention models, of considerable size, of two flying machines, an Antoinette (of which we saw a specimen not much larger flying with startling noise later at Versailles) and one of Wright's earliest machines.

As Hungary is an agricultural country it was to be expected that one of the many museums would be devoted to that industry, and we were not disappointed, for in the park was what seemed a former villa converted into a museum that was certainly attractive

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if not extensive. One cannot too often take to heart the lesson that a dwelling house, whether built for peasant or prince, is not entirely suited for museum purposes, and here it was very clear, still the illustrations will show a pleasing variety of outside, even if the interior is not suited to an economic exhibition room. Figs. 53-54. In one of the alcoves outside is one of the charming portrait statues so abundant in this city. It is in bronze and portrays in a



56. HOFMUSEUM IN VIENNA.

most comfortable, if unusual attitude a patron of agriculture in Hungary, Count Caroly.

The National Museum, mainly devoted to painting and sculpture, but with the usual bit of archæology, is shown in Fig. 55. Its contents are worthy of the fine building.

We had our choice of travel to Vienna by rail or water, and economy as well as sentiment led us to a voyage in June upon the Danube River. A night and most of the next day brought us to the canal that extends from the river to the midst of the city, and we landed on a Sunday afternoon on a quay so deserted and quiet that had it not been for an acquaintance made on the voyage, we

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57. DR. FRANZ HEGER.

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should have had some trouble in finding a conveyance to the hotel. Vienna quiet on a Sunday! The trees on the Ringburgstrasse had leafed out since my last visit in the early Spring of 1896, and other changes were noticed, but the Hofmuseum was externally the same. We had met Dr. Heger in London and did not expect him here, but his assistants afforded us all needed help, and Dr. Steindachner, head of the natural history portion of the grand museum, was there and welcomed us most hospitably. In the hallway was a group of Gangetic gavials that showed the most advanced of modern taxidermy.

Dr. Steindachner personally conducted us through the collection. After seeing the gavials I thought the birds would be found even better treated, but we were told that they had not money to mount the birds as might be desired. A fine giraffe had a steel (or bronze?) case to himself, but the cost (about $240) was too expensive for general use. Still, all the cases were good, and the arrangement of shells on black cards with gold border very effective. The Testudinata were the finest I have seen. The skeletons of fish were exquisite.

The building is so fine and artistically decorated with a ceiling by Makart, among other color schemes, that I was surprised to learn that they were not rich and had not the income so large a museum needs. When the city fortifications were destroyed the land was sold and the proceeds furnished the fine halls and some other public buildings, but no fund was set aside for endowment. The Government grants are not liberal and the great number of attendants and the large staff must require much of the income. In the attic were eight cases of coral Dr. Steindachner had collected in the Red Sea; there were also several dismounted skeletons of whales. We looked into the herbarium, which is in the upper story, but there was no one to open the cases which, like the doors, were carefully locked. This herbarium contains 950,000+ sheets and 20,000+ morphological numbers. As it was about the hour for déjeuner we left the museum and in the afternoon had a long drive about town. July 4th early we were at the Ethnological Museum and went carefully through the whole. The Mexican feather work had faded since my last visit; the curious New Britain musical instrument described in my last visit was labeled

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"*Biulapagancy*". In the Solomon Islands case was a fine wooden shield with decorations of pearl shell cut in squares and set as mosaics, the best example of several seen in museums. Among Tongan things were three good baskets, one very fine; many good combs of high reticulate form. Much good kapa (from Cook's collection?), some of it Hawaiian. A good Hervey Islands lace mat. A Tahitian poi pounder with unusually high sides to the top.[1] Rapanui had many figures of ordinary form and quality and a small carved octopus; bone tatu needles and a wooden penis six inches long, carved with open meatus and double end. New Zealand bark baskets, jade earrings, two splendid jade mere, several tiki mounted on mirror, bailer with penis handle, carved wooden coffin with bones only (no skull); carvings not noteworthy. The cases in mid room had cupboards of oak with solid doors, the upright portion of the cases had doors of metal frames, and in front of these on the cupboard a table frame case of metal, very good and effective for exhibition.

Vienna contains a large number of scientific and art societies, some with museums; among these may be mentioned the Kaiserliche Akademie der Wissenschaften; Altertumsverein Anthropologische Gesellschaft; Geologische Gesellschaft; K. K. Geographische Gesellschaft (with more than 2000 members); Wiener Mineralogische Gesellschaft; Verein für österreichische Volkskunde, with a museum of 30,000+ objects; K. K. Zoologisch-Botanische Gesellschaft, with a library of 30,000+ and herbarium of 40,000 specimens; K. K. Menagerie at Schönbrunn, with a large collection; K. K. Zentral-Anstalt für Meteorologie und Geodynamik, with seven seismographs and 4500 observation stations (Melde-stationen); and many other scientific institutions less closely connected with our museum work.

At Munich, July 6, 1912. As at Hamburg, there is here a General Konservatorium der wissenschaftlichen Sammlungen des Staates, and under this are ranged seventeen scientific societies or museums, among them the Anthropologisch-prähistorische Sammlung; Botanischer Garten und Pflanzenphysiologische Institut; Botanische Museum, with some 280,000 specimens and collections of fruits and woods: Ethnographisches Museum; Geo-

[1] A similar one from Cook's collection I found later at Wellington and have shown to illustrate this.

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logische Sammlung; Mineralogische Sammlung; Paläontologische Sammlung; Zoologische Sammlung und Zoologisches Institut; and outside of this state commission are the Münchener Gesellschaft für Anthropologie, Ethnologie und Urgeschichte; Geographische Gesellschaft; Bayerische Botanische Gesellschaft zur Erforschung der Heimischen Flora. A Zoologischer Garten was founded in 1911 at Tierpark Hellabrunn.

By the kindness of Dr. Walter Lehmann, Kustos of the Royal Ethnographical Museum, we visited his collection on a closed day, and were well repaid. The condition of the treasures in his charge is the usual one in good live museums—crowded to the utmost capacity of the rather unsuitable halls in the Arkaden. In the Hawaiian department there was not much—a feather cape of small size and a mahiole; some poor lei niho palaoa; 10 good ohekapala; maika stones; 3 poi pounders; 8 stone adzes; 2 anklets and 3 figures, 2 about a foot long, the other about 3 feet; of these we are promised photographs.[1] The Australian collection was unusually rich in carved stone churingas, more than 70; perhaps 6 horned boomerangs and several of the large carved ones; many ceremonial shields with emu down tufts and other ornamentation. Many New Ireland chalk figures of very good quality—one a double one, male and female back to back, none of them so indecent as is so often the case. From Admiralty Islands a large bowl, 3 large totem poles with lizard in relief, combs of considerable size and new design. A few Matty Island articles. A Gilbert Islands coconut fibre armor of which we are promised a photograph. There were remarkable specimens of pottery from the southern part of Dutch New Guinea with raised designs evidently copies of wooden carvings; one head was remarkable in having the eyes repeated in diminishing size on the other sides of the bowl. There were a number of other things in this collection, especially huge shields, entirely new to me. From the Solomon Islands was a new form of dancing flaps, and hermaphrodite figures, of which photographs were promised. A fine Maori cloak, a good Tahitian kapa beater, a lot of New Guinea pillows, good Fijian clubs, Rapanui figures, Samoan and Tongan clubs, carved Mangaian paddles and adze handles, one of the paddles carved in a mat

[1] Illustrations of these are given in the sequel, Figs. 215-217.

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pattern I had never seen before,[1] 2 Marquesan clubs and the head of another, 6 stilt-rests, inlaid Fijian pillow of fine quality, 2 good duk duk masks, one of braided sennit representing a bird with long open bill, 2 fern figures from Malekula. There were 3 of the New Britain musical instruments, and Dr. Lehmann sounded the one his predecessor Dr. Max Buchner had sounded for me in 1896.

The twin towers of the Frauen-Kirche, built before Columbus discovered the New World, were still as much a landmark as ever, but the very interesting Bavarian National Museum had been



58. THE ZWINGER, DRESDEN.

transferred to new quarters in extensive buildings in the Prinz-Regenten-Strasse. For variety and interest this collection ranks among the first in Europe. Our one day in this attractive city hardly left us time to glance at the Glyptothek and the old and new Pinacothek, and early the next morning we were on the way to Dresden.

The Königlich. Zoologisches und Anthropologisch-Ethnographisches Museum, of which Dr. Arnold Jacobi is Director, is in the Zwinger (Fig. 58), and as the opening hour was not early we had time to look at some of the parks and gardens on our way thither. As might be expected in such an art centre the gardens

[1] Since found in Chicago and Salem, Mass.

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grew artistically and the ribbon gardening was the finest seen. In the Zwinger we passed through the natural history portion of the museum noting on the way a remarkable group of birds of Paradise. The good collections of the Ethnographic Museum will be listed in the sequel, but here we may mention the beautiful arrangement of the Hawaiian feather garments, of which this museum has a choice collection, including the cloak with green feathers formerly in private hands in London. The iron case in which these are kept is most suitable for such purpose, and I hope the Bishop Museum may later have a similar one for the better preservation of her treasures in that line: drawings and specifications were obtained for that purpose. Perhaps the thing that attracted us most in this feather exhibit was the skilful way in which the plain illustrations of the Bishop Museum publication on Hawaiian feather work had been colored and arranged in frames on the wall. It was well to see so many capes and cloaks together in their own colors as they had never been assembled before. We afterwards saw the same process used in the Dominion Museum in Wellington, N. Z., but on a much smaller scale, and it was a source of regret that the museum could not have published the original memoir with these attractive specimens of the old Hawaiian art in color.



59. DR. ARNOLD JACOBI.

In Leipzig the south side of the Königsplatz is mostly occupied by the Grassi Museum which was erected in 1893-96 from a bequest

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60. GRASSI MUSEUM, LEIPZIG.

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61. DR. KARL WEULE.

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of Herr F. D. Grassi who died in 1880. It contains both ethnological and industrial art collections. A fine building, but seemingly too much exposed to fire from the adjoining business blocks. While central and accessible, it is unfortunate that it could not have more open space around it, for no insurance could replace the choice treasures in its cases. The portion we are most interested in is the Städtisches Museum für Völkerkunde. In our eagerness to see this we came before our time, but spent the wait-



62. STAIRWAY IN MUSEUM.

ing minutes in the adjoining market with interest, if not profit. I remember that the museum building was nearly finished but not occupied at the time of my last visit. We found one of the finest collections in Germany on exhibition. The Director, Prof. Dr. Phil. Karl Weule, and Dr. Ernst Sarfert welcomed us, and with these well-known ethnologists we arranged an exchange of specimens that will, we hope, be for the advantage of both museums.

As Leipzig is the centre of the German Book Trade it was our desire to see the Buchhändlerhaus (Booksellers Exchange),

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where we found priced samples of the latest publications of the association and many other trade conveniences, but near by was an adjunct that was more interesting still, the Buchgewerbehaus. This is open to the public and contains, beside the museum, the fine Gutenberghalle, decorated with mural paintings by Sascha Schneider, a statue of the great printer, and busts of Senefelder the inventor of lithography, and König the inventor of the power press. The museum of the Book Trade started in the acquisition (in 1886),



63. MARQUESAN CARVED BOX.

by the Government of Saxony, of the Klemm collection of early printing, and in this were specimens from the eighteen towns that had printing presses before 1471, and a copy of the famous Gutenberg 42-line Bible printed at Mainz, 1450-55. To these are added collections and models representing the technical processes of book making—printing, illustrating, binding, a fairly complete and exceedingly instructive museum.

From these arts of peace we were driven to the field of the battle of Leipzig (Oct. 16-19, 1813), that terrible slaughter in which some 450,000 men were engaged and a quarter of them were killed by the rest. To commemorate this humane achievement a most imposing monument is being erected and will doubtless be ready for the centennial of the battle.

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64. BUCHGEWERBEHAUS, LEIPZIG.



65. GUTENBERGHALE.

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Onward to Berlin where I hoped to have more time to study the great Museum für Völkerkunde, in which I saw so much and learned so much on my former visit. This is naturally the dêpôt for the collections of the frequent Government exploring expeditions, and I had expected to find many new things. New things there doubtless were in the museum, but—Dr. Adolf Bastian, the



66. MUSEUM FUR VOLKERKUNDE.

distinguished Director who welcomed me in 1896, had passed away in the fulness of years, and my friend Dr. Felix von Luschan, then Curator of African and Polynesian Ethnology, had left the museum and taken the chair of Anthropology in the University of Berlin. I, however, met him in the rotunda of the museum and he explained that the very riches had in a degree stifled the museum: they could neither show nor exchange; the cases were packed too full to allow the contents to be studied, or, in some cases, to be seen. The prehistoric department and Dr. Schliemann's Trojan collec-

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tion were still visible. It certainly is not the fault of the Government that this state of things exists, still less is it the fault of the staff. I was assured that the Government had made suitable provision for a large tract and ample building not far out of town and



67. A GALLERY IN THE MEERESKUNDE MUSEUM.

easily accessible, but two of the trustees objected to removing from the city, and as they could not agree the subvention was diverted to other needs until an agreement could be reached.[1]

In the Chateau of Monbijou we saw the Hohenzollern Museum, an interesting collection of personal matters and portraits from the

[1]Since this was written I am informed by Dr. P. Jessen, of the Kunstgewerbe-Museum at Berlin, the plans have been definitely agreed upon for a new museum.

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Great Elector to the present day. At the change of guard we saw the amusing "goose step," another legacy of the past. The Tiergarten has greatly changed for the better, and the Sieges-Allée has been added at the expense of the Emperor, with thirty-two statues of Prussian rulers placed on either side, and as a background to each a semicircular bench is placed, flanked at either end by the portrait busts of contemporary statesmen or warriors: the whole effect is dignified and most interesting. At Charlottenberg the palace was visited and the mausoleum.

I had included Monaco in my itinerary, that I might see how near to my dream of a museum of the sea and its inhabitants the fine Oceanographic Museum of the Prince of Monaco might approach; I had already seen the Marine Station at Naples, but I had not known of the Museum für Meereskunde in Berlin. On my former visit there was a small aquarium, but now I found a large and sufficiently inclusive museum in Georgenstrasse 34-36, provided with an excellent guide-book from which I may translate the explanatory introduction. The germ of this museum seems to have been the collection in the Royal Friedrich-Wilhelm University made by Baron F. Von Richthofen in 1890. I have taken from this same guide-book several of the excellent illustrations.

"The object of the museum is first, by the aid of its collections, to arouse interest and to disseminate widely a knowledge of the Sea and its phenomena, then, by research, to make known the wealth of its life, and its economic value and also the national significance of commerce, navigation and naval power. The size of the ocean, its chemical and physical properties and the ocean currents are illustrated by an oceanographical collection. In an especial room, the 'Instrumentarium', instruments are kept which are used for navigation and ocean investigation. In a biological section the life of the sea is exhibited, and in a fisheries section is shown the economic use of sea creatures. One collection is devoted to the History of Ship-building, Navigation, Commerce, Harbors and Life-saving apparatus from the political-economic point of view. Besides these three collections there is that of the Imperial Marine illustrating the history and development of the German navy.

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"Temporarily the Museum is situated at 34-36 Georgenstrasse in a building formerly used by the Chemical Institute of the University, near the Friedrichstrasse station . . . . The museum is not only to serve the Royal Berlin University, but above all for the education of the people. On this account we have endeavored to explain each object with detailed notices in terms easily understood; this guide giving a general idea of the collections and the connection as a whole. A small reading room near Room VI is open to visitors.

"The Management of the Museum will be grateful for any suggestions and cooperation in the development and perfection of the institution."[1]

The illustrations will show the general arrangement of the museum, but there are several matters shown that need perhaps a word in explanation. The beautiful model (Fig. 68) shows:

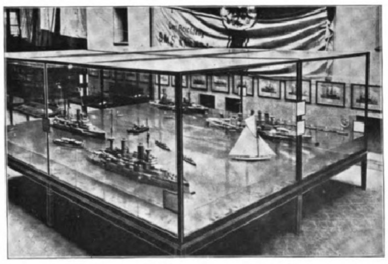
"The flagship 'Kaiser Wilhelm de Grosse' (Kaiser class) ready for sea, the boats are lashed up, the gangway up, the cable which holds the ship to the buoy can at any moment be slipped and allowed to fall, the guns are drawn in, the crew are on duty. The sister ship, 'Kaiser Barbarossa', on the contrary has cleared her decks for fighting, the boats are left behind in the harbor, she shows no sign of life, and only after close inspection some signal men are noticed hidden in the feuer schutz, and at the ports of the Commander's station human heads are to be seen here and there. The guns are ready and the enemy is expected on the starboard side. The topmast flags are waving gayly in view of the enemy. The line-ship 'Elsass' (Braunschweig class) presents a peacefully active scene at sea. It is midday recess; officers and men are amusing themselves on that part of the upper deck etiquette allows to each. The boats lie near the forecastle, the gig at the starboard gangway. The Commander is just going down the ladder, and the officer on duty with the 'gangway boys' are giving him the customary salute. On the larboard side the steam launch is being lowered, and a number of men are filling the long boat, for the boatswain's mate has just given the signal to lower this. On the starboard side diagonally from the 'Elsass' is a line of boats moored. They are the boats of S. M. S. 'Worth' (Brandenburg class) which are to be protected from the coal dust of their vessel which is

[1]Translation by the Librarian, Miss E. B. Higgins.

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coaling. On the 'Worth' the whole crew are busy loading coal from the lighters. The 'Worth' holds by her own anchor, while the three other ships of the line are made fast to station buoys. Men-o-war, with flags flying, torpedo boats, sail boats, among them the sailing yacht 'Commodore' beating up against the wind, all make the picture as lifelike as possible.

"Behind this large case, which measures 6×5 m., are models of small cruisers: the 'Condor,' intended only for foreign service as station ship, is unprotected, but provided with sails in case of



68. SHIPS OF THE LINE AT ANCHOR IN HARBOR.

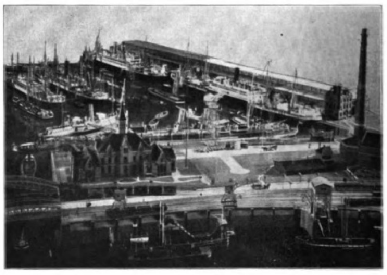
need. This type is out of fashion, as are also the iron-clad cruisers 'Irene' and 'Gefion'. The course of development leads past these to the modern armed, fast 'Little Cruisers' represented by the model 'Niobe'. In this ship collection the *Avisos* (despatch boats) are no longer in use; there are several models of them at one side behind the Little Cruisers. Their place is now taken by the Little Cruisers and the Torpedo boats."

The models of fishing craft are as complete, if not so numerous, as the war department exhibits. One shows the fishing smack on the glassy surface of the supposed water, and the drag-net

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spread on the bottom awaiting its prey. Nets, traps, lines and hooks in many forms for many uses. The model of a portion of Hamburg harbor is wonderfully constructed on a scale of 1 to 100. (Fig. 69.) It was made by W. Albrecht. An accompanying map of the whole harbor shows what a small portion of the whole is represented in the model. At my previous visit I was much interested in the works then in construction in the Hamburg harbor,



69. MODEL OF HAMBURG HARBOR (PART).

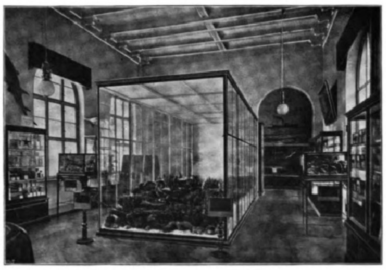
and the portion shown in the model includes the wharfage of the Hamburg-American line.

In the biological section is shown a portion of a coral reef from the shore of the Red Sea near the Sinaitic peninsula (Fig. 70); other fine specimens of coral, shell, casts of fish (the last mostly of sharks and similar fish, and not so well colored as our own specimens) occupy the cases and the walls above. Surely when a suitable building is provided this oceanographic museum may well lead the world. The mere handbook is a brochure of 152 octavo pages, and I have given but the briefest sketch of what in full would fill a portly volume.

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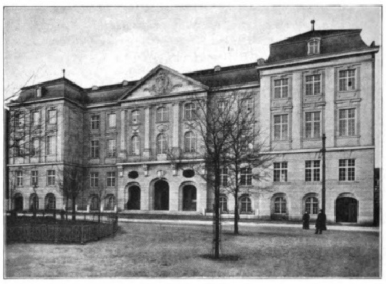
Other museums in Berlin are numerous, but we had no time to push our studies farther as we greatly wished; even the very attractive Kunstgewerbe Museum, enjoyed on a former visit, must be passed by, for our rather tyrannical "schedule" ordered us to leave on the morning of July 15th for Cologne, where we arrived about four in the afternoon, and found our Hotel Dom in the shadow of the cathedral, which seemed quite the same after an absence



70. CORAL REEF ON SINAI SHORE, RED SEA.

of forty-six years. All over Europe these grand landmarks remain nearly unchanged in the midst of strenuous improvement, or at least innovation. The remnant of the day was spent in getting our bearings about the city and communicating with the Director of the new Rautenstrauch-Joest Museum, Dr. Willy Foy, who, with his assistant, Dr. Graebner, received us the next morning most cordially and showed us the treasures in their charge. This museum has a society (Verein zur Förderung des städtischen Rautenstrauch-Joest Museums für Völkerkunde), of which the President is Dr. C. Joest, to assist in various ways, especially by

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71. RAUTENSTRAUCH-JOEST MUSEUM.



72. INTERIOR STAIRWAY.

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73. UPPER STAIRWAY.



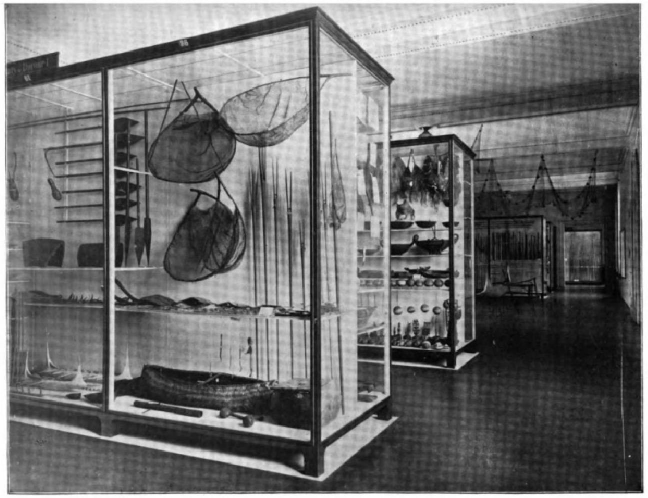
74. AFRICAN HALL, RAUTENSTRAUCH-JOEST MUSEUM.

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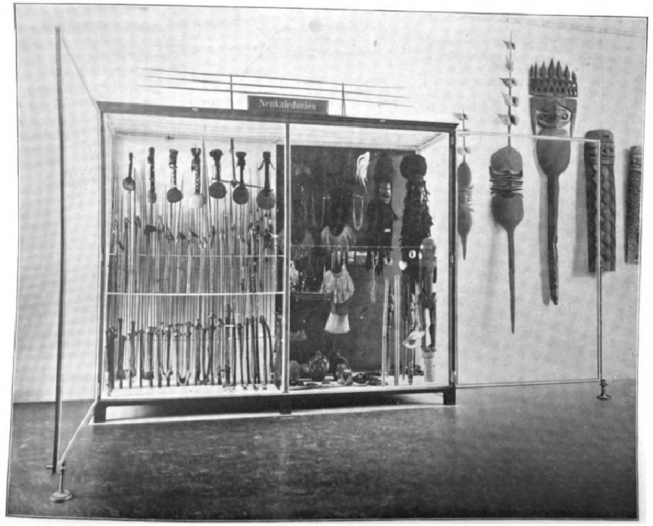
publishing the *Jahresbericht*, I-IV (1904-1907), and *Ethnologica*, I (1909). From the latter publication I have taken by permission the views I shall give to show the building and its arrangement of cases, in many ways the best we saw on this journey. The building (Fig. 71) is plain but dignified and well suited to its purpose, and the museum is well fitted to give instruction not only by its exhibits, but by their arrangement and installation. As everywhere in new museums the excellent steel cases are used, and the direction has been liberal in giving illustrations and details of all these so that their colleagues may readily profit by their experience. So far as I could see these cases are giving full satisfaction, and I know are being adopted by other museums where old wooden cases are laid aside. (See Budapest, Sydney, etc.) The hall containing the African collection is shown in Fig. 74, and it will be noticed that the cases are all free from the floor and easily moved if a change of position is desired. The floors are all tile or concrete and of excellent surface; the columns plain, but not to the extent of ugliness, the ceiling is high and the light excellent. The conveniences for reading or notetaking are provided, and there is room for central cases when such are needed. Electric light is provided in case the museum should be opened in the evening. The good collection from the Bismarck Archipelago (Fig. 75) is well shown, and the method of dividing the case by cloth partitions stretched on T-iron frames and easily removable. As will be seen, there is no lack of shelving (of glass in many museums), and these are as readily removable. Many specimens are suspended from the top of the case; others, as spears and paddles, are attached directly to the partition. It is often awkward, in arrangement of specimens, to have the partition in the structural middle of the case, and the method used here obviates all this. The doors are sufficient and easily opened; in the New Caledonia collection (Fig. 76) the case is shown with doors open, and the convenient little jacks should be noticed, as they are needed to sustain the great weight of the plate glass doors, the casing being of the smallest possible section to avoid unnecessary obstruction of vision. Note also in Fig. 76 the labelling of the case and the neat arrangement for supporting spears which do not require case protection. Other such objects are attached to the bare wall.

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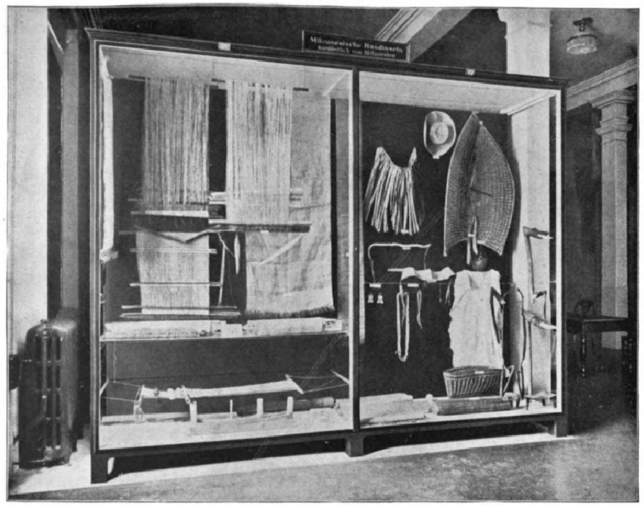
75. COLLECTION FROM THE BISMARCK ARCHIPELAGO.

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76. NEW CALEDONIA COLLECTION.

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77. MICRONESIAN COLLECTION.

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When we came to window cases, we found both here and at Dresden very admirable examples which cannot easily be surpassed for convenience of storing or exhibiting any small specimens; these will be described below, but first I would call attention to the free standing cases shown in Fig. 78. which are easily moved and are especially adapted for central spaces in halls. Another example will be shown in the account of the Australian Museum



78. EXAMPLES OF FREE STANDING CASES.

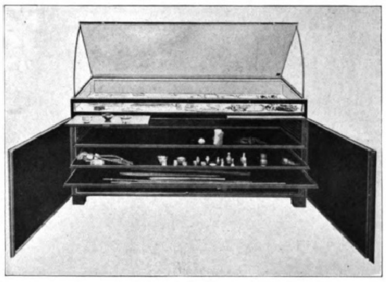
in Sydney. The number of specimens such cases can hold is astonishing, and of course they are well fitted for groups such as are shown in the Bishop Museum. These cases are 3.50 m. high, and the central one is 6.50 m. long. The number of small specimens such cases will hold and sufficiently display is well shown in the illustration. Of course the cases can be made of any size to suit particular locations, but in building a new hall it would be wise to arrange for cases of nearly uniform size to permit of rearrangement of any special group of specimens.

Now as to the smaller table cases, often called window cases, but which would be convenient cases for a picture gallery around the walls, or in double row back to back down the centre of a hall.

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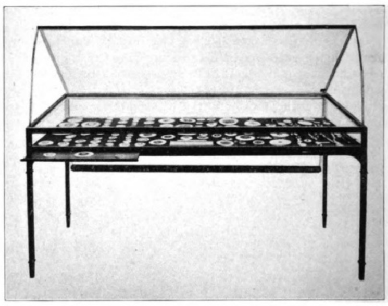
As will be seen in Figs. 79-81 these are made either with subclosets for storage, or completely open. Fig. 79 shows the former open, that the very convenient interior may be studied. In all these the heavy glass top is balanced so that there is no trouble in opening or keeping open at any degree. In some cases the balance is by weight at the back or in the legs, but it would seem more convenient to have a strong spring coiled as in the familiar window



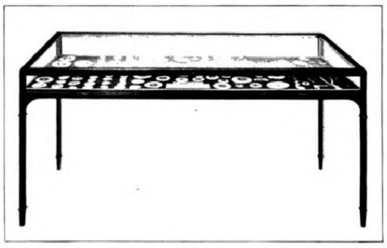
79. TABLE CASE WITH SUBCLOSET.

shades, or on the camera stands common in America; but whatever method is used, the cases and their convenience will appeal to any museum manager, apart from all question of cost, and the improved methods of manufacture and consequent increased demand have greatly reduced that. Another question confronted me as to the locks; I believe a more convenient and better lock is made in this country than any I saw in Europe, but the American lock is probably more costly. All these cases that I have studied in continental museums, are made principally in Dresden, Frankfurt and Leipzig, but work of equal quality, if not of so artistic design is made in the United States, especially in New York, for the many

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80. TABLE CASE, OPEN.



81. TABLE CASE CLOSED

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new libraries springing up over the country, where every article of furniture is of steel well enamelled, and not only fire-proof but, what is of more importance to us, insect-proof.

From Cologne our way led by boat down the Rhine to Mayence and thence by rail to Frankfurt am Main where we were seeking the museum of the Senckenbergischen Naturforschenden Gesellschaft, of which I have the honor of being a corresponding member. Also the Städtisches Völkerkunde Museum. The former museum



82. SENCKENBERGISCHE MUSEUM.

has not merely a fine new building, but also a very extensive and well arranged collection of natural history which we could profitably have studied longer than our time permitted. The latter we found in the former Thurn und Taxissches Palace. It was founded by HR. Dr. Bernard Hagen in 1904 by the cooperation of the Anthropological Society of Frankfurt and the State, and Dr. Hagen is the Director. In his absence Consul Francis C. A. Sarg, his honorary deputy, was very obliging in showing us the collection, which, although not large, yet contains some choice specimens, as may be seen by the illustration of the Maori carved box, Fig. 86. Doubtless in a city so abounding in scientific societies and wealthy and educated inhabitants this museum should considerably expand. Its present palace of the Prince of Thurn and Taxis,

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83. VOLKERKUNDE MUSEUM ENTRANCE.

as may be seen in the illustration, is not well suited to museum purposes. The cases, however, contain many choice things, As will be seen in the lists in the latter part of this report, a very good representative collection is on the shelves. The collection of stone churingas from Australia is very large: a few years ago there were no such specimens in any museum in Australia, let

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alone Europe, and now there are hundreds. I have no good reason for doubting the authenticity of these stones, but the prevalence of counterfeiting in other matters of ethnology causes some uneasiness when one notices such a sudden and enormous increase in these comparatively easily imitated stones. Later I found them equally abundant in the Australian museums. The Palm Garden of this city surpassed any we had seen in the facility with which

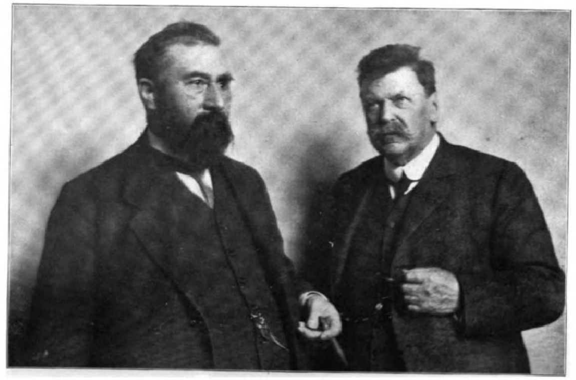


84. INNER HALL.

one can pass through and examine the many beautiful conservatories. Many if not most glass houses are crowded with plants, and there is hardly passage for the gardeners, but here the houses radiate from a central rotunda and visitors pass down one wide path and up another so as to easily see the whole without danger to the plants or discomfort to the visitor. Except at Dresden we saw no better ribbon bedding in the open gardens.

On the 19th July we left Frankfurt and the same evening we arrived in a through car at Paris. With our usual good luck the Sunday we were in Paris was the day for the monthly *Grand Eaux* at Versailles, and I had an opportunity to compare the crowds

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85. DR. HAGEN AND MR. SARG.

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with those I had seen on similar occasions in 1866 under Napoleon, and in 1872 under Thiers. It seemed to me that the difference was very great; it was no longer *en fête* as formerly, but only like any crowd of tourists. Another innovation, not unacceptable, was the aviation field near by where we saw nearly every form of aeroplane in practice, and the horrible noise of the motors was



86. MAORI BOX AND LID.

disturbing to novices; we had already seen from the train one of the German balloon-suspended passenger airships (Count Zeppelin) passing over our heads.

The interesting ethnological collection formerly in the *Musée de Marine* at the Louvre had been removed to other exhibition halls, and later we found some of the specimens at the Trocadero. Others may have gone to the museum at the Jardin des Plantes, but we were unfortunate in finding that museum closed, and the Director who had succeeded to Dr. Hamy, who, on a former visit to the old museum was my guide, was away on his vacation. At the earlier visit in 1896 the new museum building was nearly complete

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87. UPPER HALL OF THE PARIS MUSEUM OF NATURAL HISTORY.

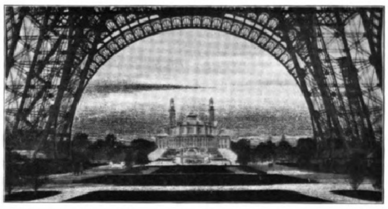


88. PARIS MUSEUM OF NATURAL HISTORY, GROUND FLOOR.

and some of the collections had been already transferred, but the cast of the Hottentot "Venus" still gathered its crowds, and enough remained to arouse great interest; so it was with no little disappointment that we turned away from the closed doors of the new museum, and we fared no better when we came to the botanical collection, which contains among other treasures the plants collected on the Hawaiian Islands by M. Jules Rémy, as that was also closed and no one could be found to open it on that day.

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The gallery of anatomy is perhaps even more crowded than that of the Museum of the College of Surgeons in London (Fig. 25), and, like that, rather confuses by its abundance. I have no good views, but Figs. 87-88 will give some idea of the arrangement and riches. The first is the upper hall, the second the ground floor. In the palæontology gallery (which could only be visited on Tuesdays from 1 to 4 P.M.) is a cast of the *Diplodocus* given by Mr. Carnegie. The gallery containing birds is also very full of choice specimens not always well mounted. This has led a cynic to remark that



89. THE TROCADERO, FROM THE EIFEL TOWER.

the prettiest specimens in the gallery are seen on the hats of the lady visitors. The *Serres* offered little of interest after those of Frankfurt, and the botanical garden, owing perhaps to the season, was no longer attractive.

We had paid no great attention to the open days of museums, partly because the guide-books are not always reliable, unless of very recent date, but mainly because we knew that the directors were always ready to accommodate us in our rather hurried arrangements; but in France we could not always find the directors, and all I had met on my former visit were dead or had removed, so that our visit to France was far from satisfactory.

In the Trocadero we did get in after waiting very profitably and pleasantly in the architectural gallery an hour or two (both are not open at the same time, perhaps for economy of janitor

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service), and when at last we entered, expecting to find the Polynesian exhibit arranged in cases after the latest fashion in the most scientific order, we found—well, certainly we were disappointed. Perhaps we expected too much after the German museums. It will be well to explain the arrangement of the interior of the Trocadero (Fig. 89) before going farther. The huge dome, flanked by two towers, covers various offices and a large auditorium or *Salle des Fêtes* containing a fine organ and seating capacity for 6000 auditors. In the illustration the wing extending to the right contains the architectural museum and the Cambodgian collection, while the corresponding wing on the left is devoted to the ethnographical collections. The room containing the Polynesian objects (most of which were packed away in 1896) was rather dark and crowded, but we found many choice things. Among these was the first pair of Marquesan stilts with the original sticks (the specimen in the British Museum has smooth modern substitutes); a good inlaid shield from Solomon Islands; four especially good carved paddles from Mangaia; a two-headed figure from Easter Island; the New Caledonian display was good, but the specimens from the eastern French colonies, the Marquesas and Society Islands, were few and not remarkable; the more noteworthy are to be found in the lists in the latter part of this report. The trophy style of arrangement of clubs that was so inconvenient for study in the old *Musée de Marine* has been adopted here also, so no catalogue of objects thus displayed can easily be made. The arrangement of one of the rooms seemed well, if unintentionally, described in a popular guide-book from which I will quote all that relates to Oceania in the upper story:

"Arms of all kinds: Polynesian stone arms: lances, arrows, bows, shields; headdresses, clothes, wicker-work, wood and iron, rudely wrought, models of pirogues of huts, statues of gods, goddesses, idols, fetiches of the gods Bouddha, Siva, Singha, etc.; busts of natives, dressed figures of Australians (man and woman), of Mabris [Maoris?], of natives of the Marquesas isles, woman printing the tapa. In the *middle of the hall* on the *left*, dancing scene (Negritos of the Andaman isles). On the *right:* Negritos of the State of Pérak (Malay peninsula); large glass case of Java objects. *On one side:* marionettes [Wajang]; *on the other*, theatri-

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cal costumes. *On the right:* sarcophagus in carved wood (New Zealand). *In front:* stern, prow, and figurehead of a New Zealand war canoe." The punctuation, if a little puzzling, is abundant; the italics are of the original. It seems hard to say that the arrangement of the room is fairly described. The Hall of America is much better, and the Hall of the French Provinces is quite interesting, with figures, dress and utensils.



90. MUSEE GUIMET.

The Hotel des Invalides has its museum, but the different portions are rather hard to find as they are sometimes moved and removed, but we at last came upon the costumed savages we were in search of, and the ethnology of the show was remarkable as it was fourteen years ago. The feathers had faded and nearly disappeared from the Hawaiian war cloak and helmet; a Gilbert Islander, called New Caledonian, was holding a Fijian spear; there were two New Caledonian short handled adzes and a greenstone disk club (neither of these war implements). It was not to be wondered at that the attendants showed little or no interest in the show.

The Musée Guimet (Fig. 90) is of quite a different character though not far distant. Its province is the religions of the East, Japan and China chiefly, and the collection of ceramics given in

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1886 by M. Guimet of Lyons is worth a visit even if one is not especially interested in oriental religions. The publications of this museum are voluminous and valuable. I was anxious to see whether there would be anything touching upon the religion of Polynesians, and although there was little in the way of images or paintings that was near of kin to the Pacific Islands Worship, I was well repaid for my visit.[1]

The Musée Carnavalet is most interesting for the history of Paris, but as I had seen it before, I passed it by, as also the Con-



91. PALAIS LONGCHAMPS.

servatoire des Arts et Métiers, for want of time. The Hotel de Cluny has always appealed to me since my first visit, now nearly fifty years ago, and I did not pass it by this time.

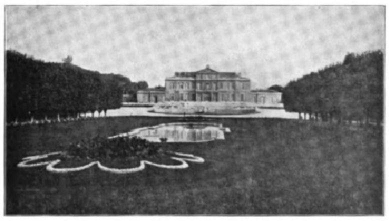
Leaving Paris, we arrived at Marseilles, where we spent the 27th of July. One lesson the Marseilles museums teach, and it is an important lesson, that besides good architecture, the surroundings are important. The mosque of Sultan Hassan in Cairo is one of the gems of Saracenic architecture, but half its beauty is lost buried in the surrounding hovels. It is not merely the danger

[1] While the Musée Guimet was founded in Lyon in 1878, after its presentation to the state it was removed to Paris. M. Emile Guimet during his travels in China and Japan collected much in both countries. From Japan alone he brought 300 Kakemonoes of a religious nature, 600 idols, and 1000 volumes of religious matter. This material is given to the world in two periodical publications—*Annales du Musée Guimet* and *Revue de l'historie des religions.*

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from fire that calls for plenty of open space; nor even the need of light, it is the frame of the picture. I think no one will dispute with me that the people of the ancient city of Marseilles have not only fine buildings, but they are beautifully framed.

The Palais Longchamp (Fig. 91) contains not only a fine museum of natural history (and Marseilles is a port to which many such specimens come), but also the civic art gallery. Both are open free every day, except Mondays and Fridays, from 9 to 12 and



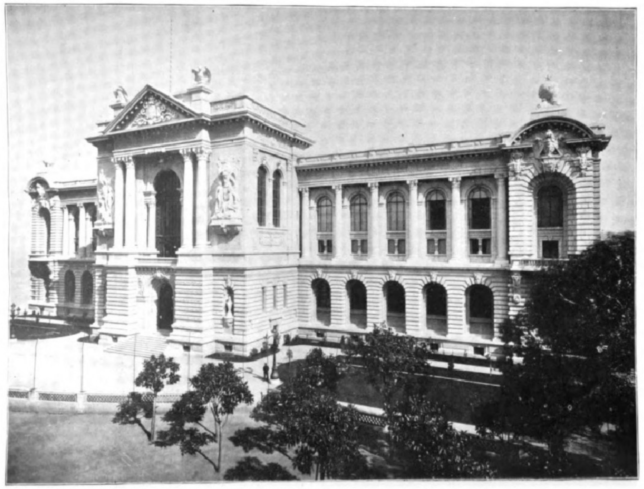
92. CHATEAU BORELY ARCHÆOLOGICAL MUSEUM.

from 2 to 4 in winter, and 5 in summer. A beatiful park contains the Château Borély (Fig. 92) in which is the civic archæological museum. Right in the city it affords a delightful promenade to those who are not attracted by the interest of the collections exhibited in the museum. Surely Marseilles is to be congratulated on these two institutions.

On July 28th we were in Monte Carlo early in the afternoon. At that season this usually gay town was as quiet as a New England town on Sunday. Shops were closed for the season, and the hotels seemed empty, but the gardens were as beautiful as if crowds were there to admire them, and the glimpses of the Mediterranean prepared us for the Oceanographic Museum at Monaco which was the object of our visit to this part of France. It was visible from our hotel at Monte Carlo and early Monday morning we drove to that marble palace.

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93. MUSEE OCEANOGRAPHIQUE DE MONACO.

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Much has been written about this beautiful museum, and one need not here attempt to go very fully into its history, which is perhaps known to every museum curator who will read this report; but for the benefit of the few others into whose hands this account may come the following extract from the account of Dr. J. Richard in his *Notice provisoire* some notes of the foundation may be given.

April 25, 1899, under the patronage of H. M. the Emperor of Germany, the corner stone was laid. Those who have seen the limited space unoccupied in Monaco will appreciate the difficulty of finding a site for any large building that should be sufficient in size and convenient of access, for "the first idea of the Prince was to found an establishment to contain and utilize the collections, more especially zoological, the fruit of his scientific expeditions since 1885 in the *Hirondelle* and the *Princesse-Alice*. But in course of time a broader idea came to the Prince, explained by the title *Musée océanographique*. That is to say, that the new museum should not merely be a home for the collections and instrumentation of the Prince, but should provide for housing everything which in a general way, is connected with oceanography."[1]

The illustration (Fig. 93) will show the fine façade rising from the normal level of the cliff abutting on the sea, while on the water side the substructure goes down in the middle two stories to nearly the sea level. The emplacement was a triumph of the distinguished architect M. Delefortrie. The central hall, from which open on either side exhibition rooms, is shown in Fig. 94. The dimensions of the building are as follows: the central portion is 20 m. square, and from this on either side extend wings 40 m. long and 15 m. wide; the monolith columns decorating the first story are 8 m. high and weigh 16,000 kilo.; those supporting the front pediment are $12^{m}70$ high. The *motifs de decoration* are animals of the deep sea (*Geryon*, *Polycheles*, *Orophorhynchus*, fishes, etc.), especially around the entrance on the avenue St. Martin, while on the summit are an albatross and eagle of gigantic size. On either side of the central front window are allegoric groups from the chisel of the

[1] It may be noted that the Prince also founded in Paris an institution for the study of oceanography, well endowed and provided with learned teachers, and distinguished trustees. Also while in Paris I learned that the Marquise Arconati-Visçonti had given the University of Paris £20,000 with which to found an institution of geography, and this is to be adjoining the former institute.

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91. CENTRAL HALL, LOOKING TOWARD THE AUDITORIUM.

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sculptor M. Dussart. These groups, which are 8 m. high, represent Truth unveiling to Science the forces of the world, and Progress coming to the aid of Humanity.

The building is surmounted by an attic rising $77^{m}90$ above the sea, and bounding an immense terrace 15 m. wide and 100 m. long. A smaller terrace crowns the tower-like front which rises $82^{m}07$, and on this opens a room devoted to meteorological observations. The museum is entirely of stone from Turbie, a secondary limestone with a grain resembling lithographic stone, except the columns of the façade and the interior, which come from Brescia, but are of similar material.

Even the door at the entrance is a work of art in forged iron, but so long as it does not keep us outside we pass it by to walk over a mosaic floor in the midst of which is the image of the yacht Princesse-Alice in which so much has been gathered. Mosaic fishes, waves, cephalopods, hint strongly to the visitor of the nature of the place—sermons in stones! On either side are stairways to the floor above; on the right the porter with photographs for sale, on the left a stairway to the basement which we used later, and passing a large glazed door we entered what the French like to call a "grand salon d'honneur" (Fig. 94), a square apartment 18×18 m. and 7 m. high. The appearance is well shown in the illustration, but the artificial lighting (which we did not have the pleasure of seeing) deserves a description, for in the centre hangs a huge crystal Medusa, and in the corners crystal globes armed with long spikes—charming enlargements of microscope marine organisms of the group Radiolaria—all these designed by M. Constant Roux.

The statue of the Prince, by M. D. Puech of the Institut, nobly presides. He is represented standing on the bridge of his yacht scanning the horizon. This was a gift by subscription of sovereigns and exalted personages of various countries. On either side of the pedestal are bronze bas-reliefs by the sculptor, one representing the chase of the whale, the other the reception of a capture of smaller game on the deck.

As we turn from the image of our noble host we see on the one side and the other through large glazed doors set in carved wood frames, into a large hall 38 m. long and $13^{m}70$ wide, and

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95. EASTERN HALL, FIRST FLOOR.

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these doors can be folded back making one of the three halls as occasion may require. Several scientific congresses have been held here where this arrangement proved most convenient.

The hall on the west (Fig. 97) is devoted to conferences, lectures and other reunions. Its walls are paneled: the caissons of the ceiling, richly decorated, are adorned with six paintings, by M. Hippolyte Lucas, of scenes relating to the sea; the smaller lateral panels have designs of marine life fitting in well with the general decoration. The wall at the end of the hall is nearly covered with a canvas by M. Monchablon, representing the favorite yacht on a deep blue sea. The windows are provided with both white and black curtains to admit or obscure light as may be required for lantern projections, and for this purpose an electric current is furnished by a transformer using the public alternating current and delivering 90–100 amperes under 110–120 volts.

The eastern hall (Fig. 95) is occupied by zoological specimens, especially those brought back by the Prince on his many expeditions: these have been studied by specialists and have yielded such information as they may to science. Here are fish from the depths; one, a *Pseudotriacis*, which is almost 3 m. long, was captured by palancre nearly 1500 m. down; other fish have been brought up from a depth of 6000 m. Four campaigns in the polar seas as far as 80° N. have furnished many specimens of arctic fauna to compare with the inhabitants of the Mediterranean, Azores, coast of Portugal, etc. The most important groups in the collections are fishes, mollusks, crustaceans and echinoderms. Among the familiar objects was a reproduction (from the Paris Museum) of *Mesoplodon bidens*, of which we have a good skeleton in the Bishop Museum, and also one of another species of this southern Pacific whale.[1]

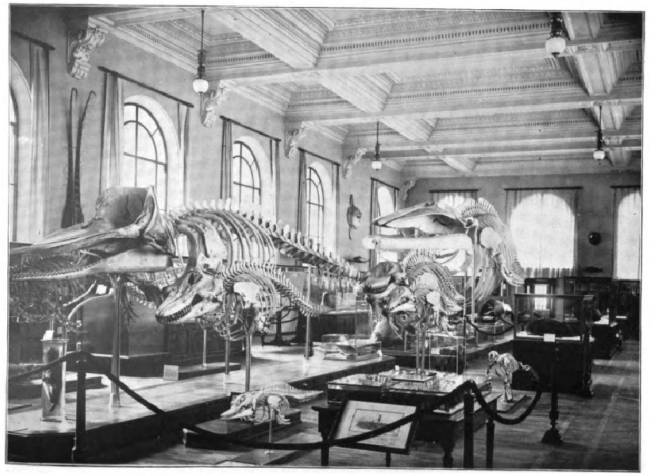
Not of less interest are the instruments used in this exploration of the sea. A fine series of diapositives explains still farther the work of the explorers. Labels are generally in French, German and English, and sufficiently full to give much information to the student, if too long to be read to any extent by the casual visitor.

Ascending to the first floor we find another square hall from which open others, as on the floor below, but here the ceiling rises

[1]See Occasional Papers, Vol. I, Director's Annual Report for 1891, a figure of *M. grayi*.

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96. EASTERN HALL, GROUND FLOOR.

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to a greater height so that the large lateral halls support light iron galleries (shown in Fig. 95) provided with cases for alcoholic and other preserves. In the square hall the object first attracting attention is a whaleboat fully armed with line, gun-harpoon, hand-harpoon, lances and all tools needed for the capture of whales. This strongly recalled to me the earlier days when Honolulu had every winter its fleet of whalers, and these boats were very common; and this memory we in the Bishop Museum are preserving in a collection of these same tools obtained in New Bedford and elsewhere, for they are now unknown in the Hawaiian group. In this room are revolving cases stocked with historical photographs of all the Prince's cruises, and much material pertaining to oceanology. The cases in this museum are of metal, as in all modern museums of importance.

The hall on the east (Fig. 95) has all that concerns physical and chemical oceanography; apparatus for sounding, dredging and fishing. The collection of the latter implements is continually growing, and as yet has little or nothing of the fisheries of primitive peoples—the ethnographic side. If the Bishop Museum could bring together (as it can with time and means) such a collection of Pacific fishing implements as Monaco has of European, especially French nets, hooks, traps, etc., it might prove even more interesting. Models of fish-traps and nets and artificial fish-ponds of the Pacific groups, such as our Mr. J. F. G. Stokes has for some time been studying and collecting in specimen, picture or model, would be both interesting and instructive, for the fashions in these are changing almost as fast in the Pacific as the fashions in dress and speech.

Of course, beside the fishing implements are series of the things caught, whether for mere ornament, as the pearl, or for food as fish, mussels, etc. This collection has a broad field. Not only are there engines so purely scientific that the ordinary visitor has no idea of how they are used or why, but those clearly industrial, that many as they pass could give name to without consulting label or guide. Here are the deep sea closing net devised by the Prince, of Professor Fowler, those of Nansen, Schmidt, Hensen, and various nets and apparatus used by different expeditions to collect the microscopic plankton of the surface, in intermediate

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97. AUDITORIUM.

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depths and far down, or to collect the fry of edible fish for stocking tanks or for fish culture.

Before a visitor has finished his journey through these public halls of exhibition he must appreciate the need of the institute in Paris for instruction in all these interesting and wonderful things, and we turn, with a sigh that we know so little of all these matters, to the basements (Fig. 98), not a part of the public exhibition, where



98. THE MUSEUM FROM THE SEA.

are the offices of the Director and his associates, the photographing room, the laboratories for examining and preparing specimens, whether the microscopic plankton or the gigantic whale; all are here in use, even a huge vat for macerating a good size cetacean. There are the many aquaria for students and experimentation, all well arranged and provided with fresh or salt water, the latter pumped from a clear pool at the base of the cliff, on which the museum stands, by an electric engine placed outside the main building. There are of course side entrances for bringing or removing specimens, and students can come directly to their rooms

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without passing through the exhibition halls. All seems to be prepared for the use and comfort of students, and doubtless many avail themselves of the grand opportunity. Even four chambers are built on the face of the cliff for the accommodation of persons who come to the museum for original research on marine subjects. Here, as in other museums, are two distinct collections, one for exhibition, the other for study.

The Institute Océanographique of Paris now owns all the Monaco museum and its dependencies, the Prince having, in 1896, given it with a foundation of four million francs for its perpetual maintenance. It is recognized (as is the French custom) by the Government as a public utility, but is otherwise independent. The administrative direction belongs to a council of administration, the scientific direction to a Comité de Perfectionnement, a body of most distinguished scientists, including the Director and our countryman, and friend of this Museum, the late Alexander Agassiz, whose father, Louis Agassiz, was my honored instructor at Harvard; the son was a valued friend from those days until his lamented death.

Tuesday, 30th July, we left Monte Carlo in the morning and, after changing time and also wasting it at Vintimille, passed into Italy, arriving at Genoa at 5:20 in the afternoon. The statue of Columbus met us as we left the station. The next day was spent partly resting in a private garden and partly on duty in the municipal museum. We took train for Rome August 1st, passing through Pisa, where we had a good view of the leaning tower, arriving in Rome late in the afternoon, making our headquarters at the Hotel Regina.

So far as ethnological museums were concerned our visit was unproductive, for owing to the summer vacation of the Collegio Romano the museum was closed. This was visited on a former journey and found to contain a large amount of valuable material collected mainly by the Roman missionaries, but without much scientific arrangement, so we were the more anxious to see if modern methods had been adopted here. We were unable to find any responsible persons in charge, and the caretakers were not willing to take on themselves any responsibility. The Museo Kircheriano, which is under the same roof, is mainly archæological and Etruscan,

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There were improvements in the arrangement of some of the sculptures of the Vatican galleries, but certain of the minor details both here and at the Lateran were simply disgusting; fortunately the wave of indecency had not extended to the Capitoline, nor to the other museums in control of the Italian Government.

There seemed great advance in sanitary matters in Rome, and the streets were cleaner than I had ever before seen them; but the very growth and prosperity of the city, especially the erection of huge commonplace apartment houses, has taken away much of the old charm. Owing to the Tiber embankment improvement we had to climb down through a back yard to get a glimpse of the good masonry of the Cloaca maxima, one of our schoolboy wonders. Certainly the improved access to some of the hilltops gives fine views over the city, but the picturesque ruins have mostly been hidden by pretentious modern buildings such as one can see in almost any European city. We were unseasonable visitors to Rome, and were disappointed, although the weather was charming. The beautiful villa Aurelia on the Janiculum, which has recently become the home of the American Academy here, was the subject of a pleasant visit, and we even crawled through a portion of the Catacombs for the first (and I hope the last) time, although we got some good out of the underground journey by the guidance of an intelligent and interesting young monk, from whom we learned more about the saints and martyrs than we expected.

On to Naples, an afternoon journey, and we reached my former resting place, Hotel Parker's, on August 6th. The view over the bay from our window, though beautiful, was not quite what it was in 1896, for then Vesuvius was in quiet eruption, and the column of smoke by day and the red eye lower down watching the city by night gave a quality now wanting from the shattered and sleeping summit of the volcano.

An early visit was paid to the far-famed Zoological Station founded by the late Dr. Anton Dohrn. This was visited with sadness, for the remembrance of the kind reception that distinguished man gave me in 1896, and the interest he expressed in my plans for a similar institution in Honolulu, which he declared was perhaps the best place in the world for such an institution, made his loss more keenly felt. We found, however, a gentleman who was

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Dr. Dohrn's assistant at the time of a former visit and who remembered well the interest the Director felt in the project, and he also showed us the great growth the Station had experienced in the interval. The "Acquario" was as interesting as ever, and we saw fishes that had been there some years before my last visit. The ordinary aquarium is replete with gaudy or curious marine animals



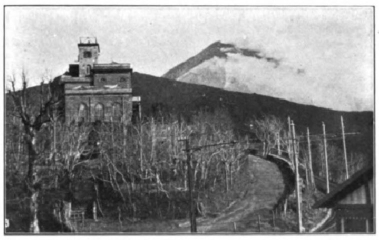
99. VESUVIUS FROM POMPEII.

that attract the uneducated visitor, but here are the scientifically interesting denizens of the sea, studied and cared for intelligently so that their life is not hindered but fostered and prolonged so that they display their habits and powers as at home. A very intelligent assistant showed us both the workrooms and the museum, which contained, as was to be expected, fine preparations of marine animals. He had himself prepared admirable electrotypes of small snakes and lizards.

The Museo Nazionale was certainly much improved in arrangement and accessibility, but the collection of papyri I wished to show to my companion was closed to everybody owing to repairs

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or changes in the room where these were kept. The collection of Pompeian and Herculanean household utensils did not seem so large or attractive as on my last visit, but a forenoon in Pompeii with a competent guide made up any deficiency. More excavations, and a much better system of repairs and protection than were visible at either of my former visits made the ancient city more attractive. A picture taken by Mr. Wilson from the second story of one of the houses (Fig. 99) shows well the altered outline of Vesuvius from



100. VESUVIUS OBSERVATORY.

that side since the last eruption. That view was a strong incentive to the ascent we made in the afternoon. Thanks to the greater conveniences of travel both can be easily done the same day.

VESUVIUS.

When I saw Vesuvius in 1896 the volcano was in a state of quiet eruption, and at night the red eye where the molten lava issued without explosive action from the side of the mountain looked down over the Bay of Naples with a weird effect quite fascinating to one seeing it for the first time. By day the ascent was interrupted by the stream covering the carriage road, and recourse was had to saddle horses whose path when crossing the slowly moving stream was covered with earth or cinder, which

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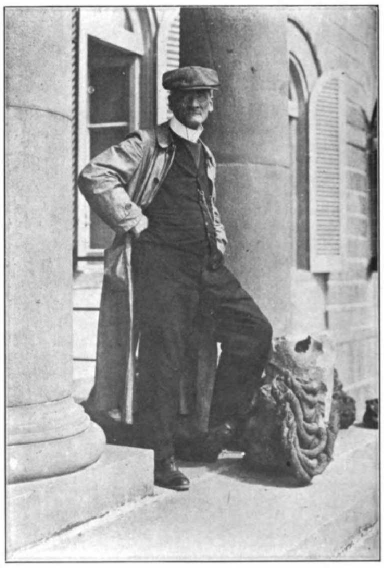
each morning was carried down stream, to be constantly renewed. At the top of the then existing cone, overtopping considerably the ancient Somma, was a plain on one side of which was the funnel-shaped opening down whose throat nothing could be seen but much heard of the troubled lava. The floor around this pit sounded hollow, and the stream of lava flowing out below seemed nearly on a level with the thumping noises within.

Today, since the last eruption, all has changed. The top of the cone has disappeared and the truncated summit is occupied by a crater (Fig. 102) much like those left in Halemaumau, of Kilauea, after a descent of the lava. A difference is in the erosion of the Vesuvian walls by heavy downpours of rain. Very slight signs of life remain in this crater; a few feeble jets of steam from the upper walls, hardly noticeable until one's attention is called to them. The old funicular railway was destroyed, and the lava flow divided on the ridge where the observatory is situated, sending its rough streams on either side with a warning that another such invasion would overwhelm the useful building.

With their usual energy Thos. Cook & Son have repaired the damages done to their transportation facilities, and now an electric railway is nearly finished from a station on the road to Pompeii, continued by a new funicular to the summit whence a good path, evidently requiring constant repair when the rains fall on the loose soil, leads around in easy grade the final ascent of the crater rim. Looking across towards Somma the latter crater rim appears higher and more commanding than from the higher cone as it was before the last eruption. It is an easy and much pleasanter ascent than before. Although the day was warm in Naples we had hardly passed through the vineyards where the grapes were coloring, when we caught the cool breezes that were playing around the summit.

As the object of our visit to Naples was principally to see Mr. F. A. Perret, and to visit Dr. G. Mercalli the Director of the observatory, we now rejoiced to find the latter at his post amid the extensive repairs necessitated by the violence of the late eruption, when the brave observers kept there in spite of the lava flows which certainly threatened the obliteration of their stronghold, and the showers of hot ash and sand, not unmixed with masses of larger size which fell upon them until it seemed an almost even chance whether stream or shower would accomplish their destruction.

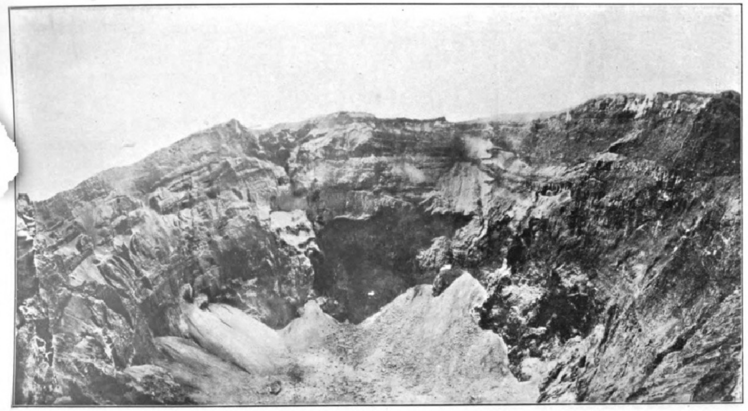
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IOI. DR. G. MERCALLI.

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102. CRATER OF VESUVIUS, 1912. PERRET.

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Dr. Mercalli received us most cordially, and after calling attention to the copy of the Museum publication "Kilauea and Mauna Loa" upon his desk, which he assured us he highly valued, took us over the workrooms and showed, among other treasures, the first seismograph made by his predecessor, also bombs from not only Vesuvius but also from Kilauea. Our time was limited, as the train was obligingly waiting for us; the greater part of the building was obstructed by staging and workmen, but we were able to gather a few matters that might be of use in the Kilauea observatory, should that desirable institution be established.[1] Later we procured for the Bishop Museum the series of lantern slides made by Chevalier Perret illustrating the late volcanic activity here and in the neighboring volcanoes. It is interesting to note that, with the present quiescent state of Vesuvius, Etna and Stromboli seem striving for precedence. While we were in Naples Stromboli, usually so regular since History took note of its work, and which was seen on my previous visit ejecting its lava with the regularity of clockwork, burst into violent eruption, threatening the inhabitants who find a home on the narrow shores around its base. Mr. Perret hastened to the scene, as he had fortold the probable occurrence. Etna has for some time been in activity, but not dangerously. It is very fortunate that so admirable and intrepid an observer should be on hand to photograph and record these new manifestations of volcanic activity. Mr. Perret informed me that the collection of volcanic specimens he had undertaken to make for this museum was well in hand. It was a matter of deep regret that the rigidity of our travel arrangements did not permit me to accompany him to Stromboli, but we shall doubtless have the results of his observation later.

We left Naples August 11th by rail for Brindisi. The route by boat from Naples would have been pleasanter, as we should have passed near Stromboli and through the Strait of Messina, having a glimpse of that earthquake-shaken region; but time was an object, and the Peninsular and Oriental steamer Osiris was a fast boat as well as comfortable. We saw many an olive orchard

[1]On my return I learned that the Massachusetts Institute of Technology had established an observatory at Kilauea for five years with a most accomplished Director from the staff of that institution, Dr. T. A. Jaggar. My visit so far as the observatory went was therefore unnecessary.

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103. ON CAMELS TO CONSULT THE SPHINX.

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as the train went rather slowly on through a region the favorite haunt of earthquakes which have left many a distinct mark. Brindisi had grown greatly in size since my first visit in 1866, but not in beauty, so far as could be seen, for it was nearly dark when we left the train and our boat departed at midnight. Ithaca was seen in the distance as we passed on, and we went so near to Zante and Cephalonia that we could almost count the stakes in the vineyards where grapes were growing to later become currants. Our arrival at Port Said was early on the morning of the third day, and we were able to take the morning train for Cairo. The track lay through a rather interesting part of the Delta, and as we rolled southward the mud-built villages became closer and more interesting, and we were almost sorry when we came to our last station.

Shepheard's Hotel could offer us a choice of rooms, and many of the other houses were closed for the summer. We found, however, that the weather was most comfortable, and the few days spent in Cairo were most agreeably spent. It was a needed rest after the rush of Europe, and after we had done our duty at the Boulac Museum we thoroughly enjoyed the city. Of course we went to the Pyramids, but not in the old way. In 1866 we had to get things arranged the day before and then start early in the morning on donkeyback, pick our way to the Nile, be ferried over on a scow, then wind our way on a narrow path between the fields, and at last get to the Pyramids late in the forenoon. We of course took our lunch with us, and after a climb to the summit of Cheops, an l a dive into the interior, we sat on the lower courses and eat our food; then it was a tiresome ride back to town and the day was finished. At present one takes a barouche or an automobile at the hotel, and an hour's drive on an excellent road over the fine Nile bridge, through the thriving suburb of Ghizeh, then on a long, straight road shaded with lebbek trees and watered with hydrants, with houses or cultivated fields on either side, brings one to the very foot of the great Pyramid, while close at hand is a modern hotel with electric lights, running water and a swimming bath, and this on the very edge of the great desert! As the Nile was rising fast the cotton growers were cutting the partly ripened crop to save what they could; it was interesting to see how fast the water rose, and the people hope for ten feet more. This rise of

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the Nile took us to the Nilometer, and we found that modern science had put up a far simpler but more exact meter near by on the island shore. Not far from the traditional site of the finding of the infant Moses is the old Ptolemaic meter, still doing its intended work.

The new Egyptian Museum is a distinct disappointment. Egyptian collections are apt to be rather disorderly, whatever country they are in, and here we looked for a fair story of Egypt's growth and civilization illustrated with authentic objects—we could not even find a papyrus, for the keeper was away and not a common specimen left outside the safe! We could learn more about Egypt in the British Museum, or in Turin, or in Leyden. We foolishly imagined that in such a vast museum, with such a wealth of material, an architectural student could see the various columns devised by the old Egyptian architect side by side, at least in cast for comparison; no such thing. The visitor must make his own chronological comparison by painful study of labels, sometimes misplaced. The small rooms of the former Gizeh palace had some advantage in the grouping of things that belong together. The art of Egypt was left in the hands of the French, while the wise Englishman carefully took the government into his own hands. Frenchmen were believed to be, as a rule, of an artistic temperament, but surely those who had charge of the arrangement and decoration of this great museum were exceptions to the supposed rule. When a red syenite statue is placed against a background of Pompeian red, either the decorators or the director must be criticised. Although the building is a new one some of the stone floors are in ruins already, doubtless owing to careless moving of the very massive statues, and yet one cannot help thinking that proper precautions would have availed for the protection of the floor. We have so many museums throughout Europe and America where scientific arrangement is wedded to a true artistic taste that when one comes upon a museum of a different quality the contrast seems more important than perhaps it should. Perchance this greatest of Egyptian collections will some day pay a little tribute to beauty while offering so much to science. The Khedivial Museum showed wondrous beauty in some of the manuscript copies of the Koran.

The obelisk at Heliopolis, the sole remaining relic of the ancient temple of the Sun, where Potiphera, priest of On and better known to us as father-in-law of Moses, once officiated, we found

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had at last been cleaned of the crust of mudwasp nests that concealed much of one side, and a railing around it shows that the Government that has done so much for modern Egypt has taken this most ancient of obelisks now remaining *in situ* under its protection and care. The neighborhood has not improved in appearance, although the evidences of land speculation are not wanting, and perhaps in another decade there will be a rising suburb here as well as on the western side of Cairo. The Empress Eugenie has built a nunnery near the well of the sun, and the famous syca-



104. COLOMBO MUSEUM.

more of the virgin is now a wretched ruin, thanks to the raids of tourists, and, although hardly two centuries old, seems near its end.

Turning from the ancient life to the most modern thing, we found, as we passed through the canal on the "Macedonia" on our way to Colombo, the process of widening the waterway most interesting. The last time journeying this way we were blocked for many hours by a small steamer getting fast and hard across the canal.

From the placid voyage inland we proceeded into a rather rough sea in the Indian Ocean after we left Aden, so that it was no easy thing to walk the decks as much as we needed for exercise; we two were the only passengers who did this each day. All were glad when we came within the breakwater at Colombo on August 31st.

In a rickshaw, of which the motive power was a Chinese, we rode out of the town to the museum (Fig. 104) which has been greatly enlarged and improved since my last visit. Here we saw

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for the first time the so-called leaf insect alive and feeding. Much of the Cingalese archæology is well exhibited here (there is a convenient handbook), and the natural history department was a great attraction; the marine zoology was well represented, and we saw many fish that ought to be well cast and painted. All the attendants, both native and foreign, did all that was needed to make our short visit profitable. At this port we transhipped to the



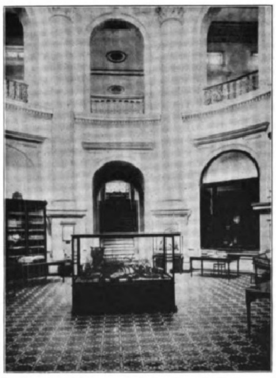
105. RAFFLES MUSEUM AND LIBRARY.

"Devanha" of the same line bound to Singapore, the "Macedonia" continuing her voyage to West Australia. The two vessels lay some distance apart and when we went ashore we intended to return to the other vessel, but we hardly expected to find that in the interval our bedroom steward had moved all our numerous traps and had arranged them in our new quarters as he had seen that we liked to have them. Late in the afternoon we were on our way to the Straits, and our voyage was uneventful until we reached Penang, where we were joined by Mr. Clifford B. Thompson, formerly of the staff of the Kamehameha Schools, now manager of a rubber plantation in Perak, who brought us choice fruits—durian, rambutan, mangosteen and a number of others we had never be-

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fore tasted, and did not even know by name. He also showed us much of great interest to dwellers in the tropics. The next day we were in Singapore where we remained a week awaiting a steamer for Batavia, and here we were met by Mr. W. S. Cookson, also



106. ENTRANCE HALL OF THE MUSEUM.

formerly a teacher in the Kamehameha Schools, and now Mr. Thompson's colleague in Perak.

Mr. Cookson took me a motor drive through portions of the island of Singapore, giving a very fair idea of the environs, stopping at the Raffles Museum and Library, Fig. 105, which certainly was a surprise; it is not so well known as it should be to all oriental students. Another day we visited the Botanical Garden. When

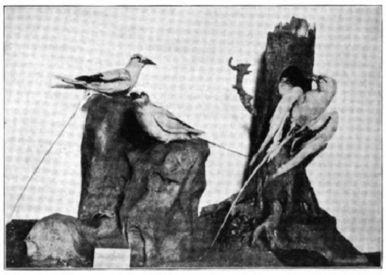
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I came to this port in 1866 on board the "Clara Morse", a good ship with a good master, I was taken to the garden as the thing most likely to interest me; and it certainly did; it was the first tropical botanical garden I had ever seen, and I well remember a fine jackfruit tree (*Artocarpus integrifolia*) standing near the entrance; I looked in vain for it now; it is not a very long-lived tree, and other interesting trees had taken its place; driveways had in the same way taken the place of the paths formerly existing, and we were Philistine enough to wish the old paths back even if we should have to leave the motor outside. Before it was Nature (and tropical at that) almost unadorned, but now it was both adorned and dressed up, and the very interesting rubber plantations with the accompanying sheds gave a commercial tone not wholly agreeable. However, Mr. Thompson's explanation of the whole process of tapping and collecting the milk-sap was not only instructive but pleasant, and I picked up a few of the many seeds scattered on the ground, which were considerably larger than ours on Hawaii of the same genus, and brought them home for experiment. The orchid growths in the open ground were fine.

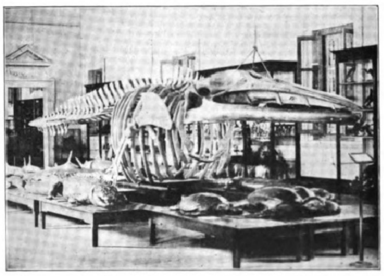
To return to the Raffles Museum, as we did the next day, the name is most appropriate, commemorating as it does one of the most remarkable Englishmen that ever made a mark in the East Indies. As to the aim of a part of this museum I am to quote from the guide to the zoological collections, which is well illustrated, and makes one wish that the ethnological part was also done in the same way:

"The zoological collections of the Raffles Museum are practically restricted to the Malay region, so that this book, besides being a 'Guide to the Museum', is a popular introduction to the study of the Malay fauna. In fact, it would have been more correct to entitle the book an Introduction to the study of the Fauna of the Malay region as illustrated by the specimens in the Raffles Museum, especially as no attempt has been made in its pages actually to guide the visitor from case to case and shelf to shelf. The visitor is expected to use his eyes, and if here and there he should experience a little difficulty in finding a particular bird or insect, he will also, when successful, partake of the joy of the numerous collectors who brought the specimens together.

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107. GROUP OF TROPIC BIRDS.



108. HALL OF THE RAFFLES MUSEUM.

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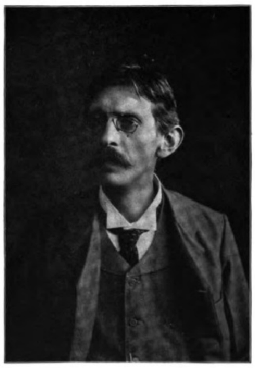
"Of the visitors to this museum the vast majority are unfortunately not acquainted with the English language. This 'Guide' will therefore mainly reach the Singapore European resident, the passenger and the Singapore schoolboy. The first with his scanty leisure, and the second with his short hours on shore cannot be expected to pay more than a hasty visit to the museum; but the case is different with the Singapore schoolboy, and it is hoped that the book will be welcome to him and that he will make ample use of it. Of recent years the number of schoolboys who have been going round the galleries notebook in hand, has been steadily increasing, and this has always been a pleasing sight. The writer would be fully rewarded for the trouble of compiling the following pages, if this 'Guide' should be their constant companion on their future visits to the museum."

The situation as to visitors is exactly the same as in our own museum, but there the parallel ends. The Hawaiian fauna is so small and incomplete that no course in zoology could be illustrated by the native specimens, while the Malay fauna, so far as representative species go is all-embracing. On Hawaii, too, the teachers are supposed (indeed are required) to accompany the pupils. To show how the material in the Singapore museum is disposed for teaching purposes Figs. 107 and 108 are given. The first exhibits a bird of which species are known throughout the Pacific, but our birds nest on rock ledges if possible, while these from Christmas Island have adopted the habit of woodpeckers; they are certainly well arranged as in the best museums. The second shows mainly the skeleton of a whale, and the guide-book describes it in this interesting way: "The museum possesses the skeleton of the Great Indian Fin Whale or Ikan paus (*Balænoptera indica*). This whale was left stranded at a place called Sabatu, about 18 miles to the south of Malacca town, on June 19, 1892. A *pagar*[1] was built around it to prevent its getting back at high tide, and the poor beast took a week to die, making a great noise for three days. Its voice was said to have resembled that of a bull. Nothing was done with the blubber, but the Hon'ble D. F. A. Hervey, Resident Councillor of Malacca at that time, caused the skeleton to be prepared and to be conveyed to Singapore. Owing

[1] Or stockade.

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to lack of space it could only be mounted last year (1907), after the new building had been opened. The skeleton measures 42 feet. So it is apparently not that of a full-grown specimen, as this species is stated to attain a length of 80 to 90 feet, *i. e.*, the size of the *Balænoptera sibbaldi* of northern seas, the largest of all known



109. DR. R. HANITSCH, PH.D.

animals, living or extinct. Fin whales are not much hunted, as they yield only a little blubber and their whalebone is of an inferior quality."

Dr. Hanitsch, the Director, was very obliging and helped us to see many of the treasures in his charge.

As at Colombo, here the rickshaws are manned by Chinese, whose muscular development is very satisfactory, as it is strongly in evidence, quite unconcealed by superfluous clothing, directly

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before one as he rides. We were told, however, that the exertion and irregular work shortened the lives of these fine looking fellows.

On the Dutch steamer "Coen" we steamed for Java, and for the first time had our full experience of Dutch *cuisine*, which certainly did not agree with me, although I afterwards got accustomed



110. RICKSHAW IN SINGAPORE.

to it, as to so many other strange dietaries. The voyage was pleasant and we passed between Biliton and Banka stopping for a consignment of tin ingots. As we approached the landing at Tandjong Priok early in the morning we passed between much shipping, mostly Dutch, and our ship's boat had no easy task to find a landing place near the custom house and railway station, and the passengers had to climb in a most undignified manner under ropes and over stagings until at last the rather dirty street was reached.

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111. A CANAL IN THE OLD TOWN.



112. BUSINESS STREET IN BATAVIA.

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We had no fire arms, so the luggage was passed without trouble, as it is everywhere except in the *civilized* United States, and after a short delay the train started for Batavia. At the Hotel des Indes we learned that it was a race week and there was not a room to be had; still worse, cholera, small-pox and bubonic plague were rife and many were dying daily. I do not know that one could have a choice of dying by any one of this terrible trio. So we at once returned to the old town, went to the excellent tourist office, where our route was planned for us and our time allotted to good advantage, found a bank open and drew our Dutch money, called on the American minister resident, and took train for Buitenzorg where we slept that night in comfort.

One need not suppose because we cut our visit in Batavia short that we saw little of the town. We saw the Dutch dwellings and their accompanying canals; we found the Commissioner of Immigration a gentleman pleasant to meet on a journey in a foreign land; he told us that most of the old regulations regarding travel had been done away, and at once repaid us the fifty guilders we had been wrongfully charged when we bought our tickets in Singapore, the agent there being ignorant of the new order of things. We found to our astonishment that white clothes could be washed clean in very muddy water, and so inferred that it was not in vain that the children and women were bathing in the dirtiest water I ever saw used for that purpose. We found later that most of the Javanese streams were decidedly mud carriers. The museum was closed and we had no time to hunt up the officer in charge, but in the grounds around were very many images and other stone sculptures, among them the rare rectangular lingams showing clearly the transition to the obelisk. The contents of this museum are of great beauty and interest; much of the product of excavations is here exhibited.

Buitenzorg is less than an hour from Batavia and some 600 feet above the sea. From the back of our hotel we looked upon a charming bit of the tropics (Fig. 113), Gunung Salak, a quiescent volcano, with its shattered crater often veiled in cloud, as in the photograph, green to its very top, the stream in the valley below evidently the favorite bathing place of the families that dwelt on its banks under the palms; the variety of greens in the foliage not

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so great as on Hawaii, but still sufficient; the bits of bambu houses playing at "hide and seek" on the edge of the forest, made a most attractive scene. We were nearer the volcano than we had been to Vesuvius when at Naples, and it was easy to see that at some not very distant past it had ejected considerable layers of ash that we could measure in the gorge below us. In front of the hotel



113. VIEW OF GUNUNG SALAK FROM HOTEL BELLEVUE.

lay the famous garden, *Hortus Bogorensis*, founded in 1817 and now the largest in the world. No wonder that the trees look fresh, for the average of rainy days in the year is 219. The garden is so little known on these Hawaiian Islands, where of all places there should be a similar institution, that it may be permitted here to give a more detailed description of its history and arrangement; and for this we are indebted to Dr. J. C. Koningsberger, the Director, to whom I am also indebted for personal guidance through the garden and for many seeds since sent to me which are already growing in the U. S. Experiment Station, thanks to

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the care of Mr. C. J. Hunn. The quotation is from the published guide by Dr. J. J. Smith.

"The botanical garden at Buitenzorg, which until 1904 officially bore the name of s' Lands Plantentuin (Government Botanical Gardens), and is still commonly so called, was founded in 1817, in compliance with an order of the Dutch Government, by C. G. E.



114. DRIVEWAY THROUGH FERNS, BUITENZORG.

Reinwardt, formerly a professor in Amsterdam. Reinwardt, after remaining for about five years in the Indies, was succeeded as director of 's Lands Plantentuin by Dr. C. L. Blume. Although this savant had already returned to the Netherlands in 1826, he still found the opportunity, it is to be said by making use of manuscripts left behind by the two young botanists, H. Kuhl and J. C. van Hasselt, to describe a very great number of new species of plants, and, moreover, compiled the first catalogue of the garden, in which he already described 912 species.[1]

[1] Blume, Car. Lud. Flora Javae nec non Insularum adjacentium. 4 vols. fol. Lugdunum Batavorum, 1828–36. [286]

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"In the period following the departure of Blume (1826 to 1868) the regular development of the garden was made difficult by all sorts of retrenchments, as, for instance, the non-filling-up the post of director. Still much important work was done during this time, of which the chief was the classification of the plants according to their natural affinities, from the carrying out of which system the garden still derives a part of its importance. Then several little gardens were laid out at different altitudes on Mt. Gede for such plants as could not stand the warm climate of Buitenzorg, of which gardens at present only that of Tjibodas, lying at 1450 m. above the sea level, still exists. The names of those who come into



115. CANARIUM AVENUE, BUITENZORG.

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prominence at this time are J. E. Teysmann, J. K. Hasskarl and S. Binnendijk.

"In 1868 a director of 's Lands Plantentuin was again appointed, viz., Dr. R. C. Scheffer, and a complete reorganization of the arrangements took place, by which further prosperity was assured.

"Through Scheffer, by the laying out of the economic garden at Tjikeumeuh and the establishment of an agricultural school, the first departure was made in the direction which was eventually



116. FOUNTAIN IN THE GARDEN, BUITENZORG.

to lead to the present Department of Agriculture. Scheffer died in 1880, and was succeeded by Dr. M. Treub, a man of exceptional scientific distinction, who, moreover, had the command of similar talent for organization, and great energy coupled with corresponding skill. The progress made by 's Lands Plantentuin under his direction was indeed astonishing. Not only were the existing institutions, such as the botanical garden proper, herbarium, studio for photographic and other reproduction, library, etc., enlarged, but, partly with pecuniary assistance from private individuals, a number of new laboratories, experimental stations and museums were built, wherein investigations concerning all branches of

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natural science, of special importance to Indian agriculture take place. Moreover, teaching institutions, etc., were added to the institute. The so-called foreigners' laboratory deserves special notice. It is arranged according to the newest demands of science, and, abundantly provided with all the necessaries, is always at the free disposal of foreign naturalists.

"Thus 's Lands Plantentuin, instead of a simple botanical garden, gradually became a scientific centre of which the old botanical garden was the nucleus. Only one more step was needed to bring forth from this arrangement, together with the other branches of official service coming into notice for it, the Department of Agriculture. At its establishment, in 1905, Professor Dr. M. Treub was made first director. The botanical garden proper forms at present one of the divisions of the department.

"The botanical garden is situated at an elevation of 265 m. above the sea level. In accordance with the very misty and warm climate the plant growth is exceptionally luxuriant. It covers an area of 58 hectares (143.32 acres), of which the greater part is planted with arborescent growth, which take a preponderating place in tropical flora. A special part of the garden is reserved for the climbing plants from a practical point of view. Furthermore, special places are laid out for shrubs, herbs, water-plants, ferns, orchids, Bromeliaceae and shade-loving growth, while in conclusion the nurseries deserve mention along with a few conservatories for foliage plants and orchids.

"In order to easily find the plants represented in the garden they are all numbered, while the sections in which they are planted, and which are mostly bounded by the paths, are indicated by Roman numbers and letters.

"It is an accepted rule that the larger plants, principally trees and shrubs, should be represented by two examples; in this way the loss of a species is practically obviated. The second example bears the same number as the first, but with the addition of A. Moreover all species are provided with labels, while there are name-posts painted red for plants which for some reason or other are outside the section destined for their natural family."

I am tempted to quote from my own notebook, as Buitenzorg was our first real station in Java. After an afternoon tea with some friends in Weltvreden we took the 4:58 train for Buitenzorg

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where we arrived long after dark owing to a very feeble engine which repeatedly gave out. The unlighted cars[1] gave us some trouble to find our traps, but the coolies could apparently see in the dark, and we were soon driving to the Bellevue where we had secured rooms. As the first thing we needed was a bath, it was pleasant to find that, in addition to the usual tank for pouring water, there was a powerful douche of clear cold water which we both enjoyed greatly. Dinner was at 8, and the tables were decorated with coreopsis and roses; for fruit the everlasting dry pineapples (we found none so good as the Hawaiian all round the world) and pisang; water from a well, and good with ice. House and grounds lighted with self-making gas (mantle) lights, very good when the boy had once lighted them; marble floors, and good large beds with the comfortable "Dutch wives". The night was cool and a blanket was desirable.

Sunday, Sept. 15. Up early; another refreshing bath and a walk about the place before breakfast. The volcano Salak (Fig. 113), close behind the hotel, is a typical cone with the apex torn off for the crater, of which the edge is much broken away towards us; clouds about the summit. Tile-roofed bambu houses in the coconut groves below us and a small river where natives were busy on the banks. After breakfast we walked to the garden; on the way a small museum was open, but the great crowd of natives made it too disagreeable to enter, and we passed by for the time. On the opposite side of the street was the range of new Government buildings for the Agricultural Department. At the garden gate was a most beautiful *Amherstia* with scarlet blossoms in profusion; then came a long avenue of buttressed *Canarium* trees clothed with *Freycinetia*, *Pothos*, *Monstera*, *Phyllodendron*, etc. (Fig. 115.) On the right was the small white temple, sacred to the memory of the wife of Sir Thos. Stamford Raffles who died here in 1814. All the important trees were labelled, but in a script not easily read. Water was abundant in lakes, pools and streams, but the vegetation was far from luxuriant; it seemed as if it had been studied to death, and left on me the impression of herbarium specimens. Surprised at the number of species of *Freycinetia;* none so beautiful as ours; the leaves of the *Monstera* were small, not a quarter of the size of some in my Honolulu garden. After several hours we returned

[1] Trains in Java do not run at night, and so the cars have no provision for lighting.

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to the hotel for tiffin, dreadful with a "rice table" and ten or more contributions to it, each a little more pungent than mustard or cayenne pepper, which required a suitable rest after it. Then with a carriage and friends we drove through the garden and to the experimental grounds, which were most interesting; various crops, including coffee, india-rubber and tobacco, were growing finely. By the roadside we got some mangoes, large, but poor and turpentiney, and which had insects inside, in the stone itself; these pests were common; jackfruit was also for sale. In the evening, rain.

Monday. Fresh and beautiful in the morning, and we visited the Zoological Museum we had not been able to squeeze into yesterday. Just within the doorway was a large cage with beautiful long green tree snakes which had just shed their skins; the strength of their muscles was shown by the horizontal extension of their bodies at least two feet, the tail holding to a branch. There were also living leaf insects and walking sticks in considerable numbers. The preserved snakes were fine, especially some bright blue ones said to be very poisonous. A lizard of great size from Flores is new, and reminds one of the prehistoric reptiles.[1] Monkeys galore and a fine group of *Paradisiae*. Man was not forgotten, and there was a good sized collection of crania and face casts. The collection is largely due to the present director, and is confined to the Dutch Indies. We went to call on Dr. Koningsberger and got separated; I found Dr. Koningsberger and with him visited the Economic Museum where the rattans, bambus and other woods, fibres, rubbers and other vegetable products, bambu hats and mats, etc., were very choice and interesting. The herbarium had a good, although rather old, collection of fruits, some exceedingly

[1] In *The Field* of July 12, Mr. Boulenger directs attention to the description, by Mr. P. A. Ouwens in the *Bulletin du Jardin Botanique de Buitenzorg* for 1912, of a gigantic monitor lizard from the Isle of Comodo, between Flores and Sumbawa. The type specimen, described as *Varanus komodensis*, measured 7 ft. in length, but a second example is reported to have reached 13 ft., and there are stories of others with a length of from 19 ft. to 23 ft. The species appeares to be related to the North Australian *V. giganteus*, which grows to 7 or 8 ft., but it has the muzzle less pointed and brown in colour, while the tail is proportionally shorter. That this giant of its tribe is distinct from all the other living representatives of its genus is certain; but Mr. Boulenger suggests that it may prove to be inseparable from *V. priscus*, of the Pleistocene of Queensland, the vertebræ of which appear to indicate a reptile at least as large as the biggest reported individuals of the Comodo monitor. (*Nature*, July 24, 1913.) [291]

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curious. The herbarium proper was contained in japanned tin cases in the gallery; the specimens thoroughly poisoned with mercuric bichloride, damp being the worst enemy here. We walked through the garden, especially the wild part, and saw many rare things. *Brownia* and *Amherstia* were in blossom and we were promised seeds. A tiny white water lily was blossoming for the first time here. *Congea velutina* was a curious twining shrub, re-



117. LAKE AND GOVERNOR'S RESIDENCE.

minding one of *Petraea volubilis*, common in our gardens, but with flowers of an Indian pink. The white *Antigonon leptopus* was growing in several places and was called "Honolulu vine". Saw many fine growing Zingiberaceae. Caladiums and Marantas; water in ginger flower-heads is secreted by the plant, although one new form of great size has the scales cup-shaped and open; a fig tree had a small white fruit all over the trunk.

We went to the laboratory and to the printing office where all their work is done, even the lithographic printing, the stones of the latter prepared by natives; make their zincos and half-tones;

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gas engine runs press. We came back to the Zoological Museum and there at last found our lost secretary. Quite a package of letters in the director's office awaiting us.

In the afternoon two friends drove with us through the native town, and we were all impressed with the good roads and the neat comfortable homes of the natives. Stones with ancient inscriptions were an object of worship in a wayside house; it seemed to



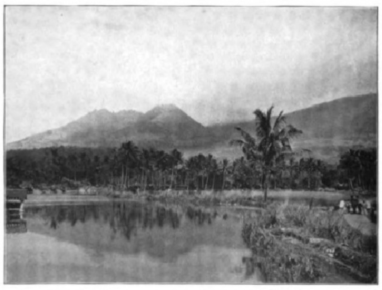
118. SAMPLE OF ROADSIDE VIEWS.

be not the inscription (which probably none of the worshippers could read), but the antiquity. Wooden gongs much like the Fijian *lali* were suspended by the side of small, rectangular, open houses, and we were informed they were to call the people to auctions or any other public gatherings. *Lantana*, *Verbesina* and *Crotalaria* were as common roadside weeds as in Hawaii. Our road lay by a rapid river in which were many bathers; house walls and fences of bambu, often woven in fancy patterns as in Fiji; fruit trees in every yard; children plenty, clothes scarce; scoop-nets drying on some house walls. There was a well-built dam

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and gateway across the river to regulate the floods; over this a narrow suspension bridge which we crossed and found very unstable in the middle. Home just in time to escape a tropical downpour which lasted into the evening.

Tuesday, Sept. 17. Up in the dark, breakfasted and took train for Bandoeng. Had the first-class compartment (for eight persons) to ourselves and were very comfortable with blinds and



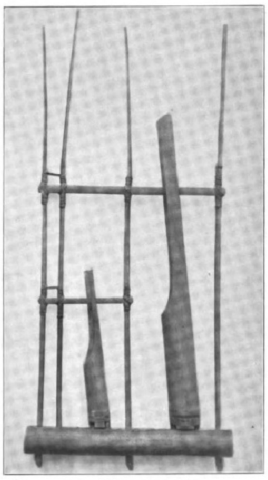
119. FISH POND NEAR GAROET.

dust screens at the windows; also rattan seats. Scenery was charming all the way (see Fig. 118). Rice plots of every size and shape to suit the situation, and the crops were in all stages of growth. One or two tobacco fields which did not look well, but the main cultivation was rice. Volcanoes on every side, their summits mostly veiled in cloud. No change of cars, and arrived at Bandoeng for tiffin. We had hoped to make an ascent of a volcano from here, but as we could get no carriage, and Mr. Wilson was under the weather, we decided to leave the next day at 11.

We changed cars at Tjibatoe; from this little station it was uphill all the way, but we arrived at Garoet at 1:37 (2200 ft.), and

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found a mandoer waiting for us at the station. Our trunk and other luggage was put in a heavy cart manned by coolies and we walked a short distance to the Hotel Papandajan (A. Hacks), and



120. BAMBU ANKLONG.

found a capital room on the front corner reserved for us. Early the next morning we drove to Lake Bagindas where we got a good view of Gunung Guntoer (Thunder Mountain), and also heard an orchestra of bambu anklongs (Fig. 120), which was not only novel

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but attractive, and we were glad to have another orchestra of small boys come to our porch and play for us almost every day we remained. The instrument is simple and well shown in the figure, and there are ten in a set sounding as many octaves. It is held by the two smaller sticks on the left hand and each player has one, making his note by a skilful shake which produces a very clear sound, almost bird-like. The little fellows seemed well pleased with ten cents (Dutch) in compensation for several tunes and a dance.

The roads were good and along the side were numerous bambu receptacles for road metal, about 2 x 4 x 2 feet, and rather fragile, judging by the number broken; they were all numbered and the weave of the basket work varied; the convenient supply of repair material perhaps accounted for the absence of holes and ruts in the roadbed. The rice fields were connected, where a stream parted them, by hollowed stems of palm trees, and we saw one of these convenient troughs being adzed out by the roadside; all the chips were carefully collected for firewood.

Garoet is surrounded by volcanoes, and the views on all sides were charming, although often dimmed by mist and cloud; several of the volcanoes were very conical, but all covered with vegetation to the top; some of the larger ones reminded me of the mountains back of Honolulu. Rice, as hitherto, was in all stages and many fields were bare. Ducks of a fawn color were very abundant, and goats were sufficiently in evidence to supply the neighbors with milk. All along the road were restaurants of varied size and provision not very tempting to a foreigner.

The previous afternoon we had been visited by numerous sellers of curiosities carved from buffalo horn, of no especial use or artistic value, sarongs, krisses and finely woven hats, some double, and cigarette cases. Best of all were the ten little boys with anklongs who serenaded us, when each in turn handed his "harp" to his neighbor and danced in front in imitation of the female dancer—a very funny show! Today the peddlers of all sorts of goods came, proving to us that, although we beat down the prices outrageously, we evidently had paid too much.

Sept. 19. The first rainy morning we have had in Java: a gentle rain that has laid the dust and promises to continue. We have already found a part of our furnishing that we could not appreciate at first—our room boy. He comes and goes barefooted

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and noiseless, but does his work very thoroughly, quickly and well, and he understands some English too. I go into the apartment and there is nothing on the table in the porch: a few minutes later I come out and the tray with my tea is there, although I have heard no sound; our bath towels are constantly renewed, a custom apparently not common in this part of the world; our shoes are taken out and in a very short time are returned in order. He will deserve his tip! Our dhobie came for clothes in the morning, and the second night brought them back well washed and ironed for ten cents (Dutch) a piece, whether coat, shirt or necktie.

In front of the hotel is a fine *Araucaria;* the borders of the road are of white *Zephyranthes;* begonias grow well, and so does *Bignonia venusta* which is in blossom now. In the gardens nearby we saw mangosteens both of the red and orange varieties, but we saw none for sale, nor did we have them on the table.

Men carry grass or other fodder much as the old Hawaiians carried grass, but have a bearing-bambu with light legs at each end which they cover with their burden, and when they need a rest these legs keep the load off the ground (often wet or dirty), and they hold the bearing-stick at a convenient height for the bearer to slip his shoulder under. The universal use of bambu is remarkable. The sides of houses as well as the frames, the doorsteps, fences, aqueducts, hats, baskets, chicken-coops, ladders, fish-traps, floors even of bridges, carpets, and many other instances where with us wood or plaster would be preferred.

The general means of personal transportation is by "*dos a dos*", a sort of two-wheeler with a broad seat, on the front half of which the driver sits, serving also as a balance weight, while his passengers occupy the rear half using the tail-board as a foot rest; in wet or sunny weather a top and curtains afford some protection, but these vehicles are not comfortable for long travel. The little ponies are brisk, strong and good-natured, generally stallions. Another pony can be attached alongside the first by means of an iron rod to hold the traces. Like the Italians, the Javanese decorate their pet animal with superfluous harness. The rain held up and our host sent a boy to guide us to a batik factory. This looked like a fine concrete residence in front; orange trees were loaded with fruit, and a bird-house held a number of small doves. We went to the back yard and entered the main building where

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half a dozen women were at work in a corner. Fig. 121 shows a similar scene, although not the one we saw. The cloth used is of native material and weave; the stands are neatly and conveniently made of bambu. The necessary fire to keep the black wax molten was smouldering in the midst, and one or two babies were in the arms or on the back of the mothers without hindering to a great extent the work. A little brass pen with a bowl reservoir is



121. PAINTING BATIK, GAROET.

used to draw the pattern on the part to be protected from the action of the dye, and when only the part to be dyed is without the waxen shield it is dipped into the desired dye; the wax is afterwards melted off in boiling water and the process repeated. This freehand work is certainly attractive, and yet evidently doomed to pass, as the print works of Manchester have flooded the island with clever imitations of good types at greatly cheaper price. It is hard to detect these imitations, as the very irregularities of the hand-made specimen are all copied; they are seldom, if ever, done on native cloth. In the batik it is important to have the color of the dyes

the desired dye; the wax is afterwards melted off in boiling water and the process repeated. This freehand work is certainly attractive, and yet evidently doomed to pass, as the print works of Manchester have flooded the island with clever imitations of good types at greatly cheaper price. It is hard to detect these imitations, as the very irregularities of the hand-made specimen are all copied; they are seldom, if ever, done on native

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uniform. Red, yellow, orange, blue in various shades, were used.[1] In an adjoining room we were shown many attractive patterns, and we selected half a dozen to be sent to the hotel for farther examination and the opinion of an expert. As a result, and on comparison with a number of specimens brought in from the street, we purchased a tablecloth and a garment not a sarong (which has two distinct patterns), for five and seventeen roupias respectively. The work seemed good and was undoubtedly genuine; it took over three weeks to make the garment purchased.

Ascent of Gunung Papandajan.

Sept. 21. The rain was pouring heavily when I got up at four o'clock; the time to start was five, and I was quite ready after a "first breakfast" of tea, bread and a banana, but the cart was not on hand and had to be sent for. It came at last and was one of the rare ones where one could look where he was going; I started soon after five, alone, for Mr. Wilson was still under the weather and fast asleep. My breakfast box was of good size and heavy, but I did not open it, and it was carefully placed under the seat. My raincoat was most comfortable, and I had a blanket over my knees while I held the curtains on both sides in protection as we drove fast with our three "paards" through the dimly lighted streets. It seemed a long way in the dark, but now and again came the delicious odor of the champaca. My contrary disposition made my spirits rise as it grew darker just before dawn, and the comfort of having escaped the company of some uncongenial fellow-boarders, made the start as pleasant as a journey begun on a much brighter day.

As we left the town the rain clouds gave out and yet left a sufficient supply of water in the rice fields that bordered the road on either side, and were visible before anything else. Their appearance was much improved as I returned the same way in the brighter afternoon. Soon it was light enough for the prudent driver to blow out his lamps, and it was not long before we met early burden-bearers coming into town. Then what I had taken for a black rain cloud to the north resolved itself into a huge mountain with its head still capped with a cloud of brighter tint.

[1] G. P. Rouffaer and Dr. H. H. Juynboll, De Batik-Kunst in Nederlandsch-Indie enhoer gescheidenei. Haarlem, 1900-5. 4to.

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Before it was fully light enough to read my watch, laborers were at their day's task in the rice ponds, and as we passed native houses a few Javans appeared wrapped in sheets, while here and there a naked little boy standing on the verandah, oblivious of the cold damp air or the passer by, was making his morning offering to Ceres, or perhaps to no special god as so many church-goers in Christian countries pay their devotions.

It soon became a puzzle to make out what the increasing number of native travelers were carrying in their baskets on their way to town. I could recognize potatoes, beets, cucumbers, firewood, eggs, nuts, baskets, paddy; but there were flat baskets filled with mysterious cakes, square-cut and of a yellowish, mottled color, which I at first took for cheese, but as I passed them there was no cheesy odor, so I imagined crude wax, badly mixed bread, and so on, but have not yet solved the puzzle. Not many of the houses were yet open, but food stalls were tempting the early and perhaps breakfastless traveler.

It was bright day when we got to Tjisoeroepan and pulled up at the Villa Pauline, which is situated in the midst of an extensive garden in which dahlias and roses were prominent. I found more flowers on my return, but was now busy in getting my paard, which soon arrived, a strong-looking pony with a very small saddle. Rejoiced to be again on horseback, I overlooked as well as overrode this saddle, from which presumption I am still suffering as I sit on a soft cushion writing these notes. Two pleasant young Javans, one to take the place of a *wegwijzer* or guide, the other as *paardenjongen* or horsesboy, ran by my steed, who did not seem willing, or at least anxious, to carry his heavy burden away from home; he returned at increased speed. Some way in the little town, with plenty of time to admire the good roads and solid concrete culverts, and bridges with walls curved inward so that only one carriage could pass at once; the comfortable bambu houses with neat fences of the same material in varied patterns, the guide-posts, that I could not always read, and the milestones that may and probably did measure something else, were all on hand: indeed I found my rather crooked way back by their means, as my paard kept generally ahead of the jongen and needed urging no longer.

It was interesting to see the passage from village to plantation as the road rose rather rapidly, and then to open land with well

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cultivated and more scattered farms. The plantations were fenced with various material, but never with cut wood or stone walls. The growing stems of the dark red *Dracæna* were common, intertwined with *Lantana camarra*, passion vine, or other twiner, while behind the fence which was often on a bank much higher than the roadbed, and was supported on the inner side by fruit or ornamental trees, were rows of coffee or white daturas in full bloom. I noticed tea plantations, the plants hardly exceeding 30 inches in height, in rows with maize or coffee between each third or fourth row and the next; coffee plantations in which the trees were high and with few berries, not looking well generally; cinchona fields which looked much cleaner and more open to the sun, but even these had fruit trees scattered through them, most of these neither in blossom nor fruit, and the foliage unrecognized by me.

At last the fenced lanes ceased and we were in the open country, although there were two sets of bambu bars across the road, which we found open on our return, so I inferred that they were only closed at night to keep out stray goats or sheep which were common enough through the country. Here were fields of groundnut and potatoes, of which the small round tubers supply the neighboring towns.

The region I was wanting most to see came at last—the native forest, and with it came much up- with some downhill climbing. The trees were dripping from the morning rain, so my coat was still in use as well as for the cool air. The clayey road or path was slippery, as it probably is most of the time, for the bed is well planted with transverse rows of flat stones set edgewise to form secure footholds for the horses, and they were much needed, as I found when my paard first chose the unstoned side of the path; I took care afterwards that he kept within bounds, although he often had to zigzag across the steep incline.

The dripping was soon forgotten, and I do not know when it ceased, for there were other things to notice, and of these the animate thing claimed attention first, for the paard was panting at the top of a steep hill after perhaps the heaviest burden he had ever borne, so I dismounted to let him rest and the boys smoke their cigarettes while they tightened the girths. On the way out, in the rain and darkness, my driver had smoked his cigarette, although I did not see him light it, and I believe he must have

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taken it ready-lighted from some receptacle (the Javanese seem to have no pockets, but their usual dress may be considered one universal pocket). The smell was nasty, but I had not the heart to stop him from the comfort he seemed to get during his disagreeable drive, and I was later rewarded for my selfdenial by a whiff of my favorite champaca.

Where we stopped the ground was white with the fallen blossoms of a tree far above our heads, and this tree was rather common. A small pink blossom on a trailing plant was bright on the banks, and the tall stems of a plant of the ginger family like an *Alpinia*, was a marked feature of the flora just here; later on a long-branching raspberry with light green leaves, much resembling the Hawaiian akalà, stretched out of the jungle over the pathway, and another Hawaiian acquaintance (I can hardly call it friend), the branching fern *Gleichenia* in two species, one certainly Hawaiian, monopolized the thicket on either side. Higher up were the brakes (*Pteris aquilina*) of world-wide distribution, but of gigantic size, showing either that they were at home or else degenerate, as some little philosophers regard the gigantesque. Tall tree ferns of graceful form and long, green, sprouting stems of the brake were intermingled, reminding me of the long green snakes I had seen twining in their cage in the museum in Buitenzorg. Another fern began to appear on the banks and preceded us high up as the crater walls,[1] graceful in leaf and long in stem, but growing less in size as it climbed the mountain, although the small, high-growing mountaineers seemed to have more fertile fronds than their grander forest brethren below.

At last the noise of escaping steam was heard and the smell of sulphur was quite perceptible, and the clear little rills that had rattled over the stones by the roadside much of the way in the forest gave place to unsightly, dark-colored streams oozing from the banks, or spreading over rocks, and hotter than they should be at that time of day or at the elevation we had reached. Soon one of the boys exclaimed "Hot!" and there was really a stream too hot for a comfortable footbath. As the woods dwindled the shrubs reminded me more and more of the flora of similar elevations on the Hawaiian group. To the *Gleichenia* was now added the club-moss (the wawae iole of the Hawaiians, *Lycopodium cernuum*), and

[1] I was fortunately able to bring good specimens to the herbarium.

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a shrub with much the habit of the ohelo (*Vaccinium*), and we came rather abruptly to the bare rocks where we soon left the paard and the paardjonjen, while the "wayknower" with the provision box and my raincoat (which I needed no more that day) went on over a roughly paved and at last steeply ascending path to the crater edge. How I regretted my vanished youth as I saw the light, half-dressed Javanese boy walk lightly up, while I had to



122. THE CRATER OF PAPANDAJAN.

rest for breath two or three times! At last we were at the end of our climb, and in a little temple to Vulcan (or whoever of the Javanese Pantheon looked alter volcanoes), erected by the Dutch Government for the greater comfort of travelers, I gladly opened my provision box for the first time (it was opened many times, later, to receive specimens of both rock and plant as we descended the mountain). I was amused, for besides two very small hard-boiled bantam eggs and a paper of salt there were two slices of buttered bread made into marmalade sandwiches, a corkscrew (superfluous, as I always carry that implement in my pocket knife), and four bottles containing ale, claret, and two of soda water. Thought of

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Falstaff and his bit of bread in an ocean of wine, and wondered whether my kind host of the Papandajan had recognized in my rather glum personality any trace of the jolly old knight.

After this temperate repast (I opened only one bottle of "American Mineral Water", and carried the rest back to the hotel where Mr. Wilson and I enjoyed the ale at dinner that night) both my wind and my locomotive powers were so much improved that I gaily followed the little guide to the steam blowhole, whose noise I had heard for a mile or more, and to the very pretty sulphur cones. We were 2600 m. above the sea, and had entered the crater through the rent left by the only known great eruption of August 12, 1772, when forty villages were destroyed and 3000 people lost their lives. The walls before and on either side 270 m. high, from which descends the little stream that flows, almost boiling, through the crater. The crust we went over was the usual solfataric crust of decomposing lava, the latter not in the least like the basalt of the Hawaiian volcanoes, but showing every shade of light gray, and even purples, and red ochre. We crossed the very respectable stream of hot water running over pebbles covered with a dark green algae, by a bridge whose timbers showed the decomposing action of the sulphur fumes. Here and there were little spluttering pools of mud or clear water, and these were scattered over a considerable area. The quantity of steam was great, and at the principal vent issued with a force apparently equal to the blow-off of a large ocean steamer; the pressure at the holes in the sulphur bank was much less. As we turned to go back the steam jet also veered, and we had to wait a minute for it to turn again, and then hastened on out of its path, for I knew the treacherous way of these natural steam jets in volcanic regions. The walls of the crater seemed to be indurated ash, and huge fragments of a more homogeneous trachytic rock were scattered about, not bombs, but real fragments, such as we saw frequently in the rice fields a long way from any vent. A few specimens gathered, and I retraced my steps, a much more difficult work than the ascent, and before I regained my little paard I passed half a dozen native women and later some men going into the crater. It was pleasant to mount again and turn down the mountain path. Many more beauties of the vegetation opened upon me with the strengthening sun. Flowers had opened and

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there were large patches of the pretty turquoise blue *Ageratum mexicanum*, over which hovered scores of beautiful butterflies, some of which I recognized as seen previously in collections.

I picked several plant specimens, and when my boys saw my interest they brought me ripe raspberries and many interesting specimens, among them a complete *Nepenthes* pitcher-plant with three tiny pitchers; it was growing on the stem of a roadside tree, and now reposes in the herbarium of this museum. It would have



123. RICE FIELDS IN JAVA.

been possible to collect many fine specimens of the flora on the way down, but it was useless, and recalled sadly my first plant collecting in the tropics, nearly fifty years ago, with my lamented friend Horace Mann, one of Dr. Asa Gray's favorite pupils and my companion over the mountains and through the beautiful valleys of the then almost unexplored (botanically) Hawaiian Islands.

Down through the villages, where the houses were now open; among them several blacksmiths' shops, where I noticed the bellows of two large bambu stems as cylinders worked by piston-rods in the hands of a boy. Everywhere the children begin to work young and work well. In many a roadside ditch, or a rice pond, mothers were administering the noonday bath to the smaller children,

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although the water, to our own ideas, was not clean enough to do much good. However, the clothes washed in similar water came home apparently clean, and if a white shirt showed no dirt how should the dark native skin? These same rice ponds (Fig. 123) were worth the journey to see: no stiff, merely utilitarian rectangular ponds such as we should have found perhaps in China, but really landscape gardening as well as hydraulic engineering: one tiny pond on the hillside had the conventional heart shape and was carefully built, although it could hold hardly twenty rice plants. At the rest house, Villa Pauline, I had to wait until my triple team (a stallion with a mare on either side) was harnessed, a delay of more than half an hour which I used to explore the garden and enjoy the fine views of the volcanic mountains that encircle Garoet plain. I found a bed of carefully cultivated golden-rod, another of lavender in full and fragrant blossom, and in the kitchen garden a good assortment of cabbages and other edible vegetables.

The drive home was cheery and the driver did not offer to smoke, for which I rewarded him with an extra tip. On the hills I noticed a primitive brake to the carts, which are two-wheeled, with the long tongue in the rear by which the men propelling can steer it: it consisted simply of a pole with one end pushed into a hole in the side of the cart just in front of the wheel, and the other end held by a boy and pressed against the rim of the wheel as he ran alongside. When the boy was absent one of the men had a rope from the out end of the pole tied around his waist so that he could exert some pressure when needed.

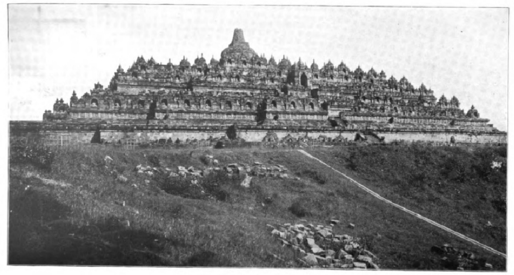
Monday 23. As usual, we were up in the dark and breakfasted ,before dawn. Our traps were carted off to the station, and every trace of our occupation removed from the apartment we had so much enjoyed for nearly a week, and about five o'clock we strolled to the near-by station with our host Mr. Hack. The mandoer had purchased our tickets, got the trunk weighed and checked, and presented us with change, tickets and baggage receipt as we came in. The ride to Tjibatoe was short and pleasant, as the day was fine, and we shortly transferred to the train from Weltvreden. The character of the cultivation changed, and although the familiar rice appeared here and there, coco palms occupied much more space, and after some miles we came to good rubber plantations with sugar-cane appearing here and there. At Maos we were able

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to stretch ourselves for a few minutes, and on our arrival at Djocja the mandoer of the Hotel Toegoe was waiting with two satellites to snatch our grips, and we were soon placed, grips and all, but the trunk (which followed later, how we never knew, but its transport cost 20 cents Dutch), in a large auto and rushed to the hotel, which we found was noisy with new buildings. Tiffin and local exploration filled the time until afternoon tea, when we were able to disperse the many women who wished to sell us sarongs and tablecloths, mostly made in Manchester, although we solemnly assured them that we could not wear the sarongs and did not need any more tablecloths. We were greatly pestered by these importunate peddlers, and in hardly less degree by a man who spread out immense mats before us which he seemed to think we needed to furnish our apartment; we did not recognize the need, and the arrival of the tea gave an excuse for sending all away while we quenched our thirst. Soon after we took a "mylord" with two horses and drove about town until after dark. We went into strange quarters and saw odd shops, but also houses of foreigners mixed in with these. There was a cemetery (*Memento mori* is always here inscribed over the graveyard gate as a name—like the carnegies in America and elsewhere), and quite appropriately near this were many "tomb sculptors" who turned out beds of a grey lava in lengths proportionate to the occupant of the subjacent grave or the purses of the bereaved friends, and upon each end, like the top and bottom of a bedstead, were fitted in sockets upright carvings of more elaborate work. The houses of foreigners (if we can so call the Dutch) seemed comfortable, and were generally surrounded by bare gravel or earth, and a multitude of pots of considerable size on raised bases, and all painted white; these filled with not very luxuriant growth of palms, ferns, etc. All had the porticos so convenient for informal meals and reception of visitors. As we returned these were brilliantly lighted with gas and mantle burners and looked more attractive than by daylight. In several places we saw the whole family with a goodly supply of children seated comfortably in the midst of the foregarden, if the aforesaid pots could make a garden. All along by the streets were concrete gutters with occasional deeper and wider cisterns, from which, by removing the cover, water could be obtained in buckets for watering the street—this seemed the common way. Everything was very dry, and yet

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124. BOROBOEDOER.

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we were not troubled by dust. One thing was noteworthy, the paucity of churches, temples or mosques: we saw only one little chapel (closed however) in our extensive ride.

In the native quarter we saw many structures of a better class, but still built of bambu and rather untidy, by no means so neat as those at Buitenzorg. The roads were good, generally wide, and often bordered by the buttressed Canarium trees so popular here, although not indigenous. The bridges were most substantial structures of iron and concrete, and a credit to the Government. All along the streets in the native part were peddlers of food, clothing, utensils, etc. Jackfruit, whole or cut in wedges, was very common and often of great size; it must be liked by the people. It was dangerous for some of the eager purchasers of this street ware, as an auto rushed by, blowing not only its legitimate horn but with an assistant blowing a louder horn at frequent intervals, but the natives all good-naturedly hurried to get out of the way of the monster, although the paards were often excited to bad manners, and even the placid buffalo seemed perturbed, while how the chickens escaped death was marvellous. High walls were common in some parts, built solidly of concrete and whitened, and we passed higher walls not whitened and of more ancient look which enclosed the Kraton or Sultan's domain. We saw the Resident's cantoor (public office), then that of the assistant Resident, and, finally, directly opposite the palace, the extensive and comfortable residence of the Resident, a most important man. His garden was well stocked with relics of the old temples, and over many of the Buddha images were placed the common native umbrellas. In various parts of the town are almost enough figures and fragments to reconstruct Boroboedoer. In one shop were many *wajangs* or puppets,[1] but I looked in vain for any of the instruments of the *gamelan* or native orchestra. It is interesting to note that in this relic of the ancient sultanate the style of batik is different from that in vogue at Garoet; so is the music, the anklong being absent, and a medley of gong and xylophone taking its place. About 6:30 we descended from our mylord at the door of our apartment in the Toegoe. A good dinner soon put us to sleep, and we found the night quiet and cool, although we had no blanket as at Garoet.

[1] For a full account of the curious Javan marionettes see *De Wajang Poerwa, eena ethnologische Studie door.* L. Serrurier. Leiden, 1896.

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125. ON THE TERRACE, BOROBOEDOER.

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Tuesday 24. Again up early, and our breakfast was eaten on our porch—tea, toast, boiled eggs, cold mutton and tongue, jam, sapodillas, and pisangs, and at 5:15 we were in our automobile bound for Boroboedoer. In recent days this excursion required a whole day, by rail, steam tram and carriage. We passed several markets on our way, and the crowds were surprising; how they got out of the way I do not know, but they did without a growl or a curse, as in less civilized lands. Surely the influence of the good Buddha Sakyamuni must still dwell among these people, whose kindness to each other, and to every beast as well, is remarkable. I had read Dr. Groneman's treatise on Boroboedoer[1] after dinner last night, and I was primed with all that was supposed to be known about the wonderful structure we were hastening to along avenues lined with Canarium trees (from which the bark had often been partially stripped, to the evident injury of the tree, probably for its tannin). I thought, as one too often does, that I had a fair idea of the wonderful pile and its carvings, of which I had also studied photographs. I cannot tell how far I was from the reality.

On the way the sky was agreeably cloudy and the air cool. The crops were again different as we hurried along. Tobacco came first, with perhaps the best specimens we had seen, some plants as tall as a Javanese farmer. The drying houses were immense structures in considerable number, indicating extensive production; the plants were irrigated. Then came sugar, and what we took for a mill near the railway in the distance. The culture of this grass did not seem clean, as it had not been stripped and the crop was blocked with dry leaves. It was being cut and carted in towards town: the long canes were slender and short-jointed, of a reddish brown color. Cassava was also grown to some extent in disused rice fields. We came to several more markets with crowds like those at American ball games, except for quietness and quaint garb. The small children here, as everywhere in Java, abundant, were quite naked, and we noticed one little girl, young enough to be allowed to go without clothes, carrying a baby in the same primitive condition. The proportion of females was great, even working in the fields, planting rice or cutting paddy in adjoining fields. A curious road roller (there was a regular

[1] *Ruins of Buddhistic Temples in Praga Valley. Tyandis Barabudur Mendut and Pawon.* Semarang, 1912. [The orthography of the names is far from settled.]

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126. ONE OF THE STAIRWAYS.

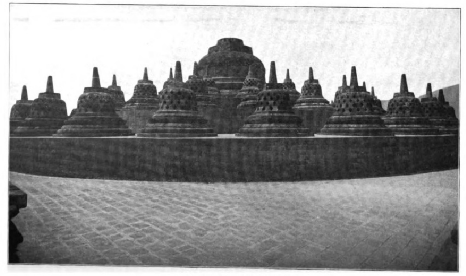
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road engine as well) was simply a large log with iron pins for axis, to which were connected for shafts two bambu poles quite unconnected to each other and pulled by a stout coolie. We passed some sheep which were scared, and when the boy driving them tried to sooth them one pushed him through a hole in the fence and into a ditch.

At last we came to a sharp, steep turn which the car mounted nobly to a plain where the great Buddhist temple was before us (Fig. 124). But there was a preliminary, and as our car left us we turned into the little hotel and paid the admission fee both to this and the lesser temple we were to visit later. Near the house were several Buddhas fallen from their former high estate, and a row of Buddha heads that looked like a Chinese execution and partly accounted for the many headless trunks we saw on the temple. We mounted the stair undisturbed by the two stone demons guarding the entrance, but followed by a guardian of less offensive form to see that we did no damage to the place, and then the wonder began. The platform has been carefully, if not beautifully, relaid in cement, and it was the only thing that seemed solid. The comparatively small blocks of dark lava, of which the structure is built without mortar, but often connected by stone keys and tenons, have been greatly displaced by the general sinking of the upper stories, due to the method of construction on the outer surface of an earth hill which the rains gradually wash down, in spite of the precautions taken by the wonderful architect, by gutters, drains and spouts. While in use doubtless the temple was kept in repair, and these precautions were sufficient; probably while the building was covered with ash from the volcano until hidden from the sight of man, the packing was enough, but an earthquake might dislocate the roof of the uncovered temple, and once the wall opened the insidious enemy entered and the complete destruction of this grand monument cannot be prevented many years, whatever means the Government may take to prevent it, short of complete rebuilding with cement. The vertical walls are now leaning in a very threatening way, and a slight earthquake will topple them down, perhaps bringing the portions above in the general ruin. All the impressive stairways, of which a line runs up each face of the temple, are already in ruins, except one (Fig. 126), which is by no means intact. How far the Government restorations have gone

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127. ROOF OF BOROBOEDOER.

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I cannot say, but the visible ones are very extensive. The bas-reliefs, of which there are bands on both sides of the galleries, represent scenes or myths in the life of Buddha and his disciples, some of which have been explained (not a few by the late King of Siam when visiting the ruins in 1896[1]), but many are puzzling and might mean various things. The execution is very unequal, some reliefs being excellent, others mere pot-boilers; most of them are discolored by calcareous solutions, apparently from the inner mound. We followed around as go the hands of the clock, that we might never turn the left shoulder to the excellent Buddha whose stony forms gaze placidly from so many niches—once from so many more.

The monkeys were well done, so were the elephants, and the fish in a dried pond which the divine Indra saved by sending rains at the prayer of a righteous Buddhist. Much time and study has been spent on these pictures, more, far, than we could spare, and we went on around and up the steep steps from gallery to gallery, not so devoutly as did some of the ancient worshippers, studying the lessons of truth and love these were intended to impart. It was somewhat the Romish idea of the "Stations of the Cross", until at last we came to the top platform (Fig. 127), where are the curious bells of stone network covering other white Buddhas. Many of these bells are entirely new, and in their midst is the domelike

[1]*Monumental Java*, by J. F. Scheltema, A.M. London, 1912 (Macmillan). This vastly interesting book should be read by every educated traveler to Java, if possible before going to that delightful island, but the author's righteous indignation at the apparent neglect of what certainly should be saved, seems to blind him to the real work that the Dutch Government has done, as shown in the two illustrations of the Chandi Mendoet. No one can excuse the plunder of the Boroboedoer by the late King of Siam under Government assent, when eight cartloads of what he considered the most interesting sculptures were carried to Siam and exhibited as spoils of Java. Neither is it pleasant to see that images and sculptured stones from this quarry abound in all the neighboring gardens and on their walls; but let us consider that without the Government restorations and protection the traveler of today would see little enough of all these wonderful buildings.

See also G. den Hamer, *De Tjandi Mendoet vóór de Restauratie* (*Bataviaasch Genootschap*, 1903).

Raffles, *History of Java*. London, 1817. 2 vols. 4to. Shows many of the ruins covered with vegetation, of which the roots were often the earlier dilapidators, but the main structure was in none of these illustrations, so utterly ruined as they were before the Dutch Government began the reparation. Much of the ruin by human hands seems chargeable to the last quarter of the last century.

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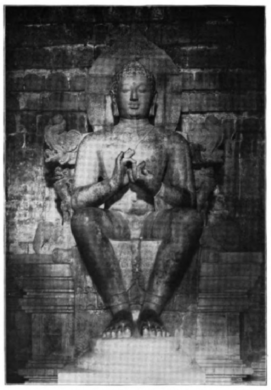
128. CHANDI MENDOET IN RUINS.



129. CHANDI MENDOET, GOVERNMENT RESTORATION.

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130. BUDDHA IN CHANDI MENDOET.

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structure opened by the English engineers years ago, and now closed again, so we could not tell where the breach was made. They found within a deep well and an unfinished statue of Buddha. The new patchwork is a little harsh, but necessary: one of the bells has wisely been left open, as it is not easy to see the contents of the others. We could not see all the view from the top for the clouds which were gathering, but we found a photograph which shows the volcanoes Merbabu and Merapi, the latter smoking like the humans here.

A feeling of sadness came over me as I climbed slowly down the uncomfortable stairs, that this grand expression of man's constructive genius, and of a people's devout love for the gentle prophet whose teachings, we can hardly doubt, have so greatly contributed to the attractive disposition of the descendants of the once powerful kingdom of Metaram, was hastening to its destruction which has so long been stayed by the protecting buttress put over the structure by the showers of ash from Merapi or Merbabu; but it was to the remarkable man Sir Thomas Stamford Raffles, Lieutenant-Governor when Java was under English rule, that we owe the full discovery of a temple whose existence had been forgotten as far as foreigners were concerned in the lapse of centuries.[1]

On our way back from this great temple turned inside out we stopped at the little temple of Mendoet (Fig. 129) about a mile away, and this has been almost rebuilt. The high stone roof had fallen in without seriously injuring the colossal figures beneath it (Fig. 128). Now we can see the grand Buddha (Fig. 130), and on either side the Buddhistic king who built Boroboedoer, and his non-Buddhistic father, and their ashes are perhaps buried beneath. Certainly the Buddha is very effective in the light from the opposite and only door. There are small niches which may have contained lamps to illumine the figures. Signs of worship were fresh on the floor.

On the path was a tree (*Leucaena glauca*), a common nuisance in Hawaii, but here the seeds are eaten it seems. A slight shower fell as we left the ruins and it laid the dust. We were back at the

[1] The great catastrophe which devastated Central Java and covered this great building, perhaps before it was completed, with ash from Merapi the still smoking volcano, has not been definitely dated, but Boroboedoer has never been utterly removed from daylight and its existence has never been forgotten.

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hotel by eleven o'clock. At four in the afternoon we drove to the Water Castle (Fig. 131), a curious structure built by a Portuguese architect for a former sultan, whose memory remains in many a legend; the bathing pools were the most if not the only attractive things remaining about the old palace. Outside a brick wall a native had captured a large blue-black scorpion, the largest I had ever seen, and we watched him noose its mate in a safe and skilful manner. At the hotel we found a *gamelan* or native orchestra and some very amusing dancers (Fig. 132); the music was rather pleasant, but the show cost us five guilders ($2.50). So, for a cloudy morning, the day ended pleasantly in fair, cool weather.

Wednesday, Sept. 25. Rain during the night. About nine we started in a smart equipage for the Resident's office to receive our permit to visit the palace. But there happened to be a reception this morning, and we had to wait. But it was not lost time, for the view of the native visitors was entertaining. The personal attendants, one with a stool, another with the betel chewing kit, another with a teakettle, another a spare napkin, etc. Some of these Javan nobles were fine-looking men, and all were interesting. In the meantime the officials sent an officer over to the palace to let us know at the earliest when the coast would be clear. This Dutch officer, who fortunately spoke French, had been in the country forty-one years, and had fourteen children; formerly an officer in the army, but for some years in the Resident's suite, proved a very sufficient guide, and we saw the place very thoroughly, but the particulars need not be described here, only in one of the many birdhouses I saw a living bird of Paradise (*Paradisea apoda*), the only one I had ever seen alive.

In the afternoon, took a comfortable four-wheeler with four little ponies for Prambinan. The road led over a flat alluvial plain mainly devoted to sugar-cane, a bright red and yellow variety. Plantation tracks were laid in the street or alongside in the open country and the cane transportation is on trucks drawn by buffalo, a slow and clumsy way. We passed several good-looking mills with white chimneys and neat surroundings, much more attractive than those in Hawaii. Every now and then we saw a little grove of *Plumiera* left in the surrounding cane, a native graveyard; this is the favorite tree for graveyards and it grows well. Another gravestone of a departed religion appeared suddenly; a quadrilateral, two-storied

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131. WATER CASTLE AT DJOJKACARTA.



132. THE JAVAN DANCE, TOPENG.

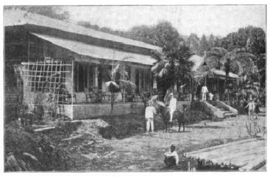
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mass of masonry that had once been a Hindu temple, and then a lesser one, both fenced in. We did not stop for these for they looked rather dangerous from dilapidation and by no means attractive, and at last came to a walled enclosure, walled against the advancing cane as well as depredators, for we saw bits of ancient cut stone from these temple ruins all along into town, and steps in the Sultan's palace were pointed out to us as coming from Prambinan or Boroboedoer, and, entering a gate, soon came to a little building where we paid 50 cents each for a ticket to view "the remains." The ruin is pitiable and in most cases complete. A few of the many square, pyramidal-roofed structures remain, and we climbed the steep steps (restored by Government, often with stones evidently intended for other purposes) and looked at the rather tiresome repetitions, far less interesting than those at Boroboedoer; one could see almost at a glance that the latter was of a higher type of religion. Here fat and generally bearded old men were hugging equally fat women; some of the latter carried spoons, while behind the men was generally the trident. The external ornamentation was often a recess or niche in which was a male dog represented barking. Alternating with these were bas-reliefs of vases with birds with human heads at the lcwer corner and natural birds above. Sometimes the entire top had fallen, and a deep square pit in good preservation, over which the image once stood(?), alone remains. In all the structure was of small, carved blocks of lava with keys and tenons, but no mortar. One had four rooms; in one of these a large statue of Ganesha, the elephant-headed god; in the others images of no artistic merit. The amount of *membra disjecta* piled up around, as wood or coal, was astonishing, and many of these fragments were well carved and all exactly cut. Corner pieces and reentering angles were evidently cut to measure, far better than the work of modern natives. We were interested but rather disappointed, and glad to get into our four-horse chariot for the home run. We ate a good dinner, settled our reckoning and retired early for our early morning start.

Sept. 26. Our room boy brought us an unusually abundant breakfast, which we ate by gaslight, as our traps were taken over to the station near by, while we followed leisurely and found the porter had purchased our tickets, got the trunk receipt, and put all our hand luggage in the best seats. We passed Prambinan,

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and then stopped for a few minutes in Solo, where the Sultan of Soerakarta holds his court, much as his neighbor in Djojka. All the way was flat, and although cool the journey was tiresome and we were glad to arrive at Soerabaja about half-past one. We were soon settled at the Simpang Hotel most comfortably, and, after a bath and tiffin, proceeded to hunt up our steamer office which, after some trouble, we found, and in it a most obliging agent who cabled to Singapore to remind the agents to see that our trunks and steamer



133. POESPO, ON THE ROAD TO TOSARI.

chairs were put on board there. As our steamer had 2000 T to take in she was sure to stop here at least one day, so we might go on to Tosari and he would wire us if the time should change.

Sept. 28. We left by the 6:10 train for Pasoeroean, where we arrived at 7:45, and our two suit cases were at once transferred to the most uncomfortable vehicle I ever rode in. There was only room for me behind and my secretary in front, and the driver together with the small luggage could not balance my weight and keep the poor pony from being lifted bodily from the ground, so I had to lean over the driver to keep the "bally" pony on *terra firma*. I, however, noticed as we drove through the town that it was large and cosmopolitan, with many European wares for sale in the shops

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and on the sidewalks. A mango about eight inches long, of a light green color, was very common here, and we afterwards enjoyed it at table both at Tosari and Soerabaja. As we got farther out we found a "stoomtram" alongside occupying a large share of the roadway, but as the trains were infrequent and stops a long distance apart it was not in our way. Tobacco and corn, with some sugar, were in the fields; the tobacco seemed a different variety, with curled leaves; they picked the leaves and left the stalks to leaf out again; the drying houses were not so well built as those we had already seen. A fine concrete and iron sugar mill, the finest we saw in Java, was passed on the road to our right.

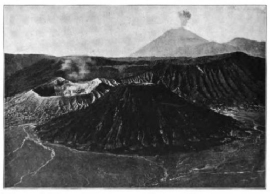
At Pasrepan, after a long and dusty ride, we were transferred to another similar cart with two ponies and then began the ascent as soon as we had left the little village. At Poespo (2500 ft.) we found (Fig. 133) a pretty little adjunct to the Tosari Sanatorium (which is 6000 ft.) where delicate people can stop, coming or going, to get gradually used to the change of climate. The view of the volcano Kawi was fine, much finer, as we afterwards found, than we got from the cloudy Tosari. Here the carts deposited us, and my secretary was provided with a pony and I, owing to my poor leg, with a chair and eight coolies, most of them mere boys. Without much delay we started, our suit cases tied securely to a short bambu and carried by another coolie who, with our horseman and guide, soon passed out of sight. There was not much to see on the way except some black monkeys high in the trees, and the road continued good and was lined all the way to the top with Casuarina trees (Tijemaras). Mr. Wilson arrived at the sanatorium at 12:30, but my boys were slow and it was 2 before I arrived and hobbled up the steps to our nice room, where our small luggage was already placed. The partitions were thin, and the ceiling of bambu mat, but the two beds had no mosquito nets, and did have two large and thick blankets as well as the universal "Dutch wife"; a gas mantle burner within the room and another over the table outside on the gallery. It was cloudy and cold, so that I sat in my overcoat as there was no fire to comfort us. It was a disappointment to find that we could not go on to Bromo the next day, as all the ponies were engaged; however, we arranged all for Monday.

Sunday, Sept. 29. It was pleasant to be able to sleep in our rolls of blankets until daylight; a rare thing for us in Java, but

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we needed the rest, and later we saw an exhibition not down in our programme. A wedding had been in progress for some days (they last a week), and the large procession came onto the lawn before our door; the forerunners, with umbrellas and curious standards, reminding of *kahilis* of Hawaii, then the bride in a chair (she was a mere child) and the groom on horseback, a fine-looking young fellow perhaps twenty years old; then the *gamelan* or orchestra, and a pair of dancing ponies. These were the most

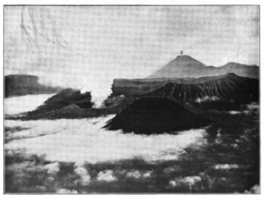


134. VIEW OF THE CONES OF THE ZAND ZEE.

amusing of the whole. They were covered with a harness like a network dotted with bright brass bosses the size of a dollar, and a saddle with a dragon's head pommel, and a tail like an old feather duster half-way between the pony tail and the saddle, and this stood erect in an absurd manner. In the saddles were what I mistook for dolls, as their faces were painted, but under all the decorations we found were two little girls, brides of a few weeks. The ponies were in charge of an old man who held two long ropes as reins, and he was so absorbed in the prancing of his animals that he frequently joined in the dance himself. It was funny to see these little stallions make their steps precisely and prance up

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to each other much in the native style of dancing. The gamelan was played all through the performance, and as a *finale* the riders were lifted out of their saddles and brought to the gallery steps where they kneeled down and received the tips of the onlooking guests. This all-important part of the show done, the whole vanished and left us in quiet comfort, but cooler than we had been since leaving Russia. My lameness made it impossible to walk about,



135. THE ZEE WITH CLOUDS.

and so the day was spent in rest and in listening to a fine performance on the piano by a young Dutchman. The hotel consists of a series of cottages in a garden where fuchsias, geraniums, marguerites, heliotropes, roses, nasturtiums, sweet peas and daturas flourish, and many of these cottages are seasonal residences of Dutch families. In a clear morning the views must be fine, but we found the place enveloped in a dry fog the latter half of the day.

Expedition to Volcano Bromo.

Monday, Sept. 30. At half-past four in the morning (or night) we started on two ponies, mine being a capital black stallion of great strength. It was a fine, full moonlight as we rode out of the village above the sanatorium, and we had to wake up the police

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who was asleep by the roadside. As the light increased a pretty flower appeared by the wayside, and more daylight revealed it as turnip blossom, luxuriant, and both in white and bluish varieties. The road was good and wide enough for chairbearers, but the valleys on either hand had very steep sides, although generally cultivated. We saw many dried pea vines, and considerable maize, the ripened ears unhusked being arranged on racks for farther drying. We at last made a considerable descent, then across cold steam cracks and up again over a tufaceous soil, no lava being visible. At last a shanty was reached on the edge of the so-called Tengger crater where we were to have our breakfast, which one of our boys had brought up with us. The view was excellent (Fig. 134), with Smeroe, the highest of the Javanese volcanoes distinctly smoking or giving out intermittent puffs of vapor. This was interesting as Smeroe had been quiet for more than a week. Bromo was steaming, but most of the cone was hidden behind the wonderfully regular Gunung Batok whose sides are almost a counterpart of a well-worn bevel gear, while farther back is the cone Widodaren; the last two are apparently extinct. The descent to the Zand zee was by a steep path through tufa, and once on the extensive plain we trotted fast over the sand, which shows distinct ripple (wind) marks and appears to be the detritus of the much eroded mud cones that cluster in its midst. Only a *series* of photographs can give a clear idea of these cones, which are about the same height, but with distinctive features. They do not seem to be of the same age, but I had no time to go around each, and the eroded mud had buried the real bases of all the cones.

This crater has been spoken of as the largest in the world (Tengger), but I still believe that the carefully surveyed Haleakala of the Hawaiian Islands is larger. The outer cliffs which have been called the walls of the crater are of the same tufaceous structure that obtains for many miles around, and seem to me merely faults in these immense tufa beds. Not a sign of lava walls anywhere. However, a geologist must not be too dogmatic on so slight an inspection as we were able to make, and I had not a copy of Junghuhn[1] at hand to see what that distinguished geologist had decided in his far more lengthy and careful examination. It was

[1] Junghuhn, Fr. *Topografische und naturwissenschaftliche Reisen durch Java.* Herausgeg. van C. G. Nees von Esenbeck. Magdeburg, 1845. With atlas of 40 plates.

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an exhilarating ride at that elevation, and we were sorry when it had to end in a rather steep and rather crooked path (Fig. 136) leading to the steps of concrete, 252 in number, that Count Henry of Mecklinburg has had built for the accommodation of pilgrims and visitors of other faiths. It should be stated here that the region around the Tengger craters is occupied by the most heathen of the inhabitants of Java, and travelers often note the independent and often surly manners of these Tenggerese. They worship the god



136. TRAIL FROM ZEE TO BROMO.

of the volcano, making annual pilgrimages to the brink of Bromo and casting in offerings (we saw some of these in the shape of small coin that had lodged in the ridges of the funnel below us as we stood on the very narrow rim of the crater (Fig. 137). They may make pilgrimages at other times, but I confess to an ignorance at present of their worship in its details. Only the annual affair is a matter of the greatest importance, lasting some days of encampment in the Zand zee. We had no occasion to complain of these people, although we saw a marked difference from the smiling Javanese in their rugged and not attractive countenances.

To return to Bromo, on whose brink we have been standing, looking at the ribbed walls of the funnel and wishing we might

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see one of the intermittent "eruptions". The furrows (Fig. 137) seemed to be due to the violent discharge of boiling water flowing back to the well at the base of the funnel, but we saw nothing but steam which climbed the farther side of the funnel and floated away. The noise of a boiling cauldron is very distinct. The ridge is too narrow for a safe path, or I would have gone to the lee side to see if any fumes of sulphur were sensible, as none were noticed



137. CRATER OF BROMO.

at the top of the steps. On our return to the rest house we heard an explosive noise, and turning to Bromo saw a black matter mixed with the steam puff which resembled volcanic dust, but how it is mixed with the steam we could not learn; this phenomenon frequently occurs and is called an eruption. Crossing the Zand zee on our return we found small bits of a sort of pumice resembling that from Kilauea. This was in windrows, or more properly waves, for water and not wind was the distributing agent. Probably washed from the older walls, as I saw nothing like it in the mass of Bromo. The evenness of the furrows made in the outside of the cones testifies to their homogeneous structure. Altogether this is

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a region well worth a prolonged study, although there seems to be great similarity in all the cones, steaming or cold. We did not see (except in photographs) the beautiful effect when the Zand zee is covered with clouds (Fig. 135); in the early morning a plain of snow whiteness from which emerge the cones. We were told that the Tenggerese (at least in the neighborhood of Bromo) have their principal house door on the side towards the sacred crater. The regularity of their villages is very great (Fig. 139), but whether



138. A CRATER FILLED WITH WATER.

Bromo is in the direction of their house fronts, backs or sides I could not tell. Another indication that the outer wall of the Tengger crater was a fault was noticed on the way out, in the deep cracks at their base, in some cases emitting steam. The return journey was made in good time and we were at the hotel by 11:30. In the afternoon we rested in the clouds. Kawi, a beautiful volcano with cones like the Bromo, has seldom been ascended and is not often visible from Tosari at this season, near as it is.

Tuesday, Oct. 1. We had made all our arrangements that quiet afternoon and at 9:20 departed on our ponies for Poespo. The only matter of note on the way was an encounter with an

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automobile in which the machine put Mr. Wilson's pony to rout, and as the rider wisely jumped off he joined in the pursuit. It was difficult to make the Englishmen in the car stop in the chase, but the thick-headed or disobliging islanders at last stopped and the pony was brought back captive. Our tiffin was at Poespo and very good; we rested more than an hour before resuming our very awkward carts. We met many of the huge native oxcarts with



139. A VILLAGE NEAR TOSARI.

wheels quite six feet in diameter; the brake was a round stick without shoe, and the drivers were often curled up asleep on the front seat, but our driver's shrill whistle caused a turnout and we must have passed nearly twenty. We got to the station at 2:30 and found that the train did not leave until 4:30, but the station was cool and we waited in patience: a Javan massage (Fig. 140) would have been acceptable. There were many fine mangoes for sale here in round, native baskets. Comfortable seats in the train and arrived at Soerabaja Gobeng at 6:05 where we found the Simpang Hotel omnibus waiting for us and were told the numbers of our

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new rooms, in one of which we found all the traps we had left neatly arranged; we had our former room boy and he was evidently glad to see us. A fine shower bath and dinner, when we had a call from the manager to ask how my lameness was, and we also found that Dr. E. C. Waterhouse of Honolulu was in the hotel, just arrived. This was good news, although we did not see him until next morning. We found that our steamer, the Montoro, was at Semarang and would probably be here tomorrow, and we should be telephoned when the launch would go out.



140. A JAVAN MASSAGE (LOMILOMI).

Thursday, Oct. 3. The Montoro arrived in the morning and we were warned to be on board before 6 P.M., as the boat would probably sail at 2 A.M. So we drove about town in search of a chair and other small matters, also collected our photographs at Kurkdjian's, had our last tiffin, paid our bill, bade good-bye to Dr. Waterhouse, and about four o'clock loaded our luggage into one carriage, ourselves into another and drove the long way to the harbor where we arrived in an hour, secured a sampan and started down the channel for the steamer. Then our troubles began, for the rowing with the small round-bladed oars was slow, and when at last we could put up the sail the wind had freshened and we laid over so well that considerable water came aboard and we were

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plentifully sprinkled. Arrived on board we found a fine large stateroom reserved for us, and the trunks and other traps we had left in Singapore all in it; our chairs were all right on deck. Although our room was the largest we had found so far on our way, we asked the second steward if he could not give us each one, and he did; we slept well with the help of the electric fan.

Friday, Oct. 4. All day loading sugar, but the weather cool and comfortable. The baths and accessories were all that could be desired; we were at the captain's table, the Chinese service was good and our meals were all we wished.

Saturday, Oct. 5. During the night we moved on to Pasoeran for 500 T more sugar, and at daylight came to anchor some distance from shore where we were soon joined by twenty praws with the expected cargo. To load this took another day and not until nine in the evening did we get under weigh. A number of curious canoes came by, evidently fishermen's, and one boarded the steamer with a single fish (a snapper) for which he asked such a price that no purchase was made. These canoes were well built, long and narrow, and rather high out of the water, with raised prow and stern. Two bambu outriggers were attached at a slight angle, the bow attachment being to a wing-like projection, at the stern the ordinary fastening. A sort of devil's head preceded by three tiny flags decorated the prow and there was a broad paddle for steering when the triangular sail was set.

Thursday, Oct. 10. Heavy squall during the night, which was otherwise hot and the electric fan was a friend in need. At early dawn we were at the wharf in Port Darwin and we went ashore. There was no train, although the rails were alongside on the wharf, and we were told that passengers from the East had a special train to take them to the town and the Botanical Garden, which by report was a fine one. We climbed the hill to the post-office but found it closed; later we posted our mail.

Port Darwin, formerly Palmerston, is situated on a bluff of yellowish limestone, folded in an interesting way and capped with Eucalyptus and other characteristic Australian vegetation. No botanist could hesitate to declare what part of the world he had landed upon. The bay that this bluff commands is extensive and bounded by low mangrove-covered islands. The wharf of cast-iron piles bolted together shows the great tidal variation which we

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later experienced during our short stay, amounting at times to 28 feet. Dismally deserted was the wharf and neither man nor beast nor cart welcomed the passengers on their landing, although we had an important government official in our company from whom we learned interesting particulars of the pearl-shell fisheries in this neighborhood. A few of the empty cars of the Northern Province Railway were dead and scattered on the tracks which extended along the wharves and on the arm which at right angles connects them with the shore. The mails in half a carload of baskets delayed our departure until 10 A.M. From Mr. Wilson, who made more extensive exploration than my lameness permitted, I learned that there were stores well stocked, also three cows, one belonging to the Administrator-General (this province belongs to the Commonwealth of Australia and has not the same autonomy as the older States), and two others to the hotel where Mr. Wilson enjoyed a glass of fresh milk after a long diet on the product of buffalo, goat and can. Flowers in the gardens looked well after the night's rain. *Bougainvilleas, Alamandas, Plumicrias, Quiscalus, Cassia fistula*, etc., were abundant, and the absence of palms was refreshing. It is said to rain here during three months 30+ inches while the rest of the year is dry. The Government buildings were rather crowded in a row—low, stone buildings without architectural ornament. A small church without steeple or apparent belfry nestled close to the squat dwellings of the Chinese, who were celebrating the anniversary of the declaration of independence of Manchu rule. Many small fishing junks and smaller sampans dotted the coves, and as the tide went out it left many of these stranded. I looked in vain for a vehicle in which to ride about the little town, and there was no evidence of a desire to entertain visitors or profit by their presence. Water is good although not abundant, and the Montoro filled her tanks with what was a great improvement on the rusty compound we had been drinking. Pipes were conveniently laid on the wharf, and I noticed an American aeromotor supplying an elevated tank, supposedly from a rainwater cistern in the ground not far from the Government buildings. A few of the aborigines were around, one gin with apparent leprosy; but the museum had been dismantled and the contents sent elsewhere; most of these, however, were ores and few, if any, native manufactures. Altogether Port Darwin seemed a healthful if not a desirable place

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of residence: the inhabitants looked well and contented. Some vegetables were brought on board by a Chinese compradore, and a closed car lined with sheepskins brought a number of sides of meat carefully shrouded in cotton cloth. The cargo that we left consisted mainly of drinkables and matches, while we took away certainly an equal weight of carefully bagged ores.

Friday, Oct. 11. Very pleasant to wake up in blue water, for all the previous day we had been in dirty green soundings. The weather was cool and very comfortable; the sea here and there covered with a good supply of "whale feed" which the steamer passed through without much disturbing, except to spread enough to show the fibrous streams below the orange-colored nuclei on the surface. A passenger from Port Darwin showed me a fine pair of buffalo horns polished, from that neighborhood; the inside was smooth, dark color, while the outside was flattened and corrugated transversely; this was a bull, the cow having round horns. This man also informed me that he had heard of a black kangaroo from the natives. He was inclined to collect such rare specimens for museums; also the "playground" of the bower bird, in which laudable pursuit I encouraged him.

Sunday, Oct. 13. We awoke in the midst of islands and a stiff breeze, and at 7:30 anchored abreast the wharf at Thursday Island. The town looked rather attractive spread out on the hill-side. A pretty little green parroquet was blown aboard and easily caught. We had to wait for the doctor and could have no breakfast until he had examined the native crew. He came at last just as the pilot boat cast off for fear of swamping, and soon began a hand-rubbing examination of the bare breasts of a long line of natives, a process which seemed to amuse them. Then the saloon passengers were passed but not rubbed, and the silly farce was over and we were able to get our breakfast. After this we went ashore. The shops were closed and not attractive; the streets were dusty but planted with *Terminalia* and other trees. Mr. Wilson went to the curious Memorial Church, but there were no services and he returned with a picture of the interior. From the deck of the Montoro the harbor seemed land-locked, and one small island seemed clearly a volcano. An hour after noon we started again on our voyage to the Albany Pass. We should have touched at Port Moresby in New Guinea, but that pleasure, as others, was dropped

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from our hurried voyage, and we turned and retraced our course out of the harbor, not sorry to leave this decaying port. The Albany Pass was the most attractive scenery we had met since leaving Soerabaja. High walls on either side; on the left a pretty cove with coco palms and a white beach; later on the right a quadran-



141. QUEENSLAND ANT HILL 28 FEET HIGH.

gular rock formation like the ruins of a mediaeval watch tower. The walls of the pass were nearly parallel and far enough apart to make a broad and imposing avenue. Soon after we had left these behind we turned southward and the moon was on the starboard side; I watched her until the setting and at ten turned in.

The Queensland coast was higher than I expected, but it looked desolate and forbidding. Here and there we saw ant hills, some evidently of considerable height (Fig. 141). On the reef side occa-

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sional low islands, and alternate blue and green water in streaks of varying width, seldom half a mile, showing a furrowed bottom. Little of interest and a cold easterly wind blowing.

Tuesday, Oct. 15. Land close all the morning and weather cool but wind less. Land high (4000 ft. ?), and I was told that the land west of this ridge was good for sugar-cane. Low Island Light was a pretty island with several good houses and a number of ornamental or fruit trees; it was connected by a low spit to another longer, jungle-covered island. At 10:45 we passed Cairns; many white houses on the beach outside the entrance; was told that the gulches on the other side were very picturesque with ferns and waterfalls. All day they were painting the ship, to the great annoyance of passengers, but as the freight did not complain it made no difference to those in charge of the boat. About 6 P.M. passed Hinchinbrook Island(?), a high, curiously outlined mountain, perhaps 2000 ft., said to have a lake in a depression on the north side, and to be shunned by the aborigines as the abode of evil spirits.

Wednesday, Oct. 16. After a pleasant night, up at 5:30 and found we were very near land. Passed a beautiful rock island on the starboard that would have been a fine site for a castle, the actual rocks closely simulating a ruin. There was a small beach in a cove, and a prolongation toward the south that looked arable. This was in the cyclone region where several steamers have gone down with all hands. February is the dangerous month. In Whitsunday Pass there were very picturesque islands on both sides of the narrow passage, some with trees like firs. All the high islands were clothed with forest to the summit. The wind blew fiercely dead ahead and was chilly. Some birds of a light color and small size had a curious way of keeping close together as they flew over the water, looking as if perched on an invisible roost which was bearing them along. Here came a conical island with nearly encircling islets, reminding one of the ruins of a prehistoric volcano, all clad in peaceful forests: no life visible, either aboriginal or introduced.

Friday, Oct. 18. Arrived at Brisbane soon after noon, and after the usual farce of medical examination came up to the wharf, still some miles from town. There stood my old friend and former assistant at this museum Acland Wansey, who had come 527 miles by rail to meet me, and it was the pleasantest sight I had seen

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since leaving Boston. As the train for Brisbane town had just departed, we engaged a capital automobile and drove rapidly to the general postoffice in twenty-five minutes. Here we got a much needed letter of credit as well as news from home. From this at once to the museum now in the former exhibition building in the park. Fig. 142 shows this large and conveniently situated building where we were soon introduced to the new Director, Dr. R.



142. THE QUEENSLAND MUSEUM, BRISBANE.

Hamlyn-Harris, who speedily convinced us of the truth of the good reports of his fitness for his post we had heard on the steamer from persons who knew the unhappy reputation of this museum in the past. Dr. Hamlyn-Harris had also the advantage of a training in the Australian Museum under that excellent teacher Robert Etheridge, Jr. In a hasty inspection under his guidance I noted his system, which seemed excellent; his tablets tasty and diagrams useful. Among the biological exhibits especially pleasing was an Emu group with a brood of the pretty striped young, and a painted background with excellent "grass trees" in the midst. Other bird groups were highly meritorious. The mineral collection was large

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143. DR. R. HAMLYN-HARRIS.

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and well mounted on tablets set in black border. Of course the ethnological collection claimed our chief attention and we found the portion already on exhibition was, as we expected, very rich in New Guinea specimens. The Government expeditions in British New Guinea have deposited their collections in the Brisbane Museum, both for study and distribution to other museums in exchange, but hitherto neither of these objects has been attained. The prospects are now very encouraging that much and good work will be done under Dr. Hamlyn-Harris, and the rich treasures now in his charge will be made accessible to all students of ethnology both by publication and exhibition. We have had to go as far afield as Germany to study the implements of Queensland's near neighbor. The two decorated mummies from Torres Strait, of which we have photographs, are in good order, the original waist garb or ornamentation having been replaced. There were also huddled mummies which are to be described soon.[1] The decorated shields and the stone knives of Australia were especially fine. Among the unarranged specimens we noticed many good things from the Solomon group. It was impossible in our short visit to even look over all the extensive collections, but we got a fair idea of the material the Director is arranging, and we laid plans for a closer connection between this and our own museum. We resumed our ride to the Botanical Garden which we found very dry and rather a playground than a garden. On our return to the steamer we found that we had driven more than thirty-two miles. We sailed at six, taking with us Mr. Wansey. The land between Brisbane and the sea is low and mangrove-fringed.

Sunday, Oct. 20. Fair weather and we were off the Sydney Heads about 2 P.M. As it was a holiday we had to wait for the doctor. When we at last steamed up the harbor I noticed a great increase of the littoral houses on both sides. At 4 P.M. we landed, and as the absurd local laws do not allow our Chinese stewards to work in Australia we had the choice of either carrying our hand luggage ashore ourselves or waiting until two very slow "white" laborers could do it for us. The sole inspector did his disagreeable work thoroughly, perhaps because awakened from his afternoon nap, and put one of our trunks through a stricter search than we had found anywhere in Europe. At last we saw our traps loaded

[1] *Memoirs of the Queensland Museum*, vol. I, pl. *Papuan Mummification.*

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on a dray, and we found a hansom outside and were glad to get to the "Australia". It had been our intention to spend two weeks in Sydney and neighborhood, but word came from the Trustees of the Bishop Museum that they desired me to visit Christchurch in New Zealand, and also Dunedin. With this sudden change of plan we went early Monday morning to Cook's and secured tickets for the New Zealand campaign. That night I went home with Mr. and Mrs. Wansey to Hornsby, and the next day in the bush, during an afternoon tramp, in which my secretary joined us, we

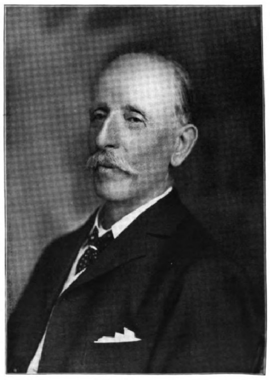


144. AUSTRALIAN MUSEUM, SYDNEY.

collected sixty-one species of plants in flower. Returning to town the next afternoon we went to the Botanical Garden, which has been greatly enlarged since my last visit. Here we had a warm welcome from Dr. Maiden.

Thursday, Oct. 24. Up early in the rain, leaving with Mr. Stockdale, from whom I had bought many specimens on a former visit, for his home near the Heads and not far from Botany Bay, to look at a new collection of curiosities he had made. We found several good things, but the prices were too high and the collection was to be sold as a whole, which put it out of the question. Returning for a hurried breakfast, we boarded the Kookaburra at Fort Macquarie with a party of friends for a trip about the beautiful

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145. R. ETHERIDGE, JR.

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harbor. The boat was well filled in spite of the lowering weather which cleared as we went along and was soon all that we could have wished, although our overcoats were very comfortable. Great has been the increase in building about the upper harbor and the views were still beautiful; we had a capital lunch at Corey's Gardens where more than two hundred sat at the tables. We were back at the landing and at 2 P.M. started for town to make needed purchases, and at the Civil Service Cooperative Stores we took the regulation afternoon tea in a most agreeable manner with some two hundred buds, blossoms and seedpods.

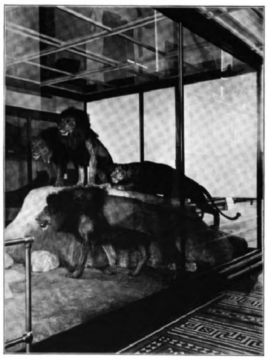
Friday, Oct. 25. In the Botanical Garden with the Director Dr. Maiden and the superintendent we had a most instructive walk through the newer portion of the grounds, and made on the way a considerable list of plants to be sent to Honolulu.[1]

Later we took a brisk walk to the museum across the Domain (Fig. 144) and found my old friend the Director, Mr. R. Etheridge, Jr., who welcomed me and we had a most agreeable chat in his office. They had just received a lot of stone *churingas* painted red, but not so good as those we had seen in Dresden and of which we are to receive specimens. Later Mr. Wilson arrived and we started for the new portion of the museum where the ethnological collections are arranged. On the way, in passing through the natural history collections, we saw perhaps the finest group of animals seen in any museum. It was by Ward and consisted of half a dozen lions halted on the rocks of a dry nullah. They were hungry and showed it in the eyes as well as in the lean and sinewy legs and ribbed sides, but on the opposite side of the nullah was a cobra coiled on a rock with expanded hood and threatening aspect. To put the varying expression of fear, curiosity, and yet longing for food into the glass eyes and mounted skins, seems more than a painter could do on canvas, but a master has done this here. I regret that I cannot present a front view of the group, but the one kindly sent me (Fig. 146) gives a partial idea of this fine work of art. Another good thing in a different way was the restoration of a

[1] These have since arrived and at the U. S. Experiment Station they found only one plant dead; the others are all thriving and may be of use to the territory, as all are desirable if they can be made to grow here. It may be mentioned that seeds sent from the garden at Buitenzorg in Java have germinated in the same place under the good care of Mr. Chester J. Hunn.

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146. GROUP OF LIONS, AUSTRALIAN MUSEUM.

gigantic fossil kangaroo. A crocodile's skeleton with the dermal bones arranged to show their relation to the rest of the skeleton was very interesting. Passing these and many other good things we came to the New Guinea hall, which was entirely new to me. A fine, large and well-lighted room, with the windows above the

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cases, had a splendid group of Admiralty Islands wooden bowls (Fig. 147). In a wall case were many painted dance paddles, and one of the largest collections of stone-head clubs I had ever seen, even the Giglioli clubs at Florence were not so numerous. New Britain carvings were also abundant and appeared to far better advantage than in the old room where they were greatly crowded. On the floor above were Australian collections of great extent and variety, including a huge tree stem carved all over, the last survivor of seven similarly carved giants. "Death stones" were abundant of various forms and material, but certainly not phallic as some have suggested. No one seems to know certainly their real use, but the most probable suggestion is that they were memorials of some place or event. The Cook relics show very well and include a number of Hawaiian and Maori objects, Mangaian paddles, Fijian clubs, etc. A careful catalogue was made of these, for it is proposed to include all the authentic Cook relics in one comprehensive account, and those museums having these are willing to contribute their share to the completeness of the account. It seems fit that at the group where the great navigator met his death, such a a memorial of the collections he made to illustrate the peoples he went among should be made.

With the new rooms this seems one of the best collections of Australian and Papuan material we have seen, if not the best. It was late in the afternoon before we left, and a week would have been too short for a sufficient study.

Saturday, Oct. 26. We found the steamer did not leave for Wellington, New Zealand, until 4 P.M. There was a great crowd at the Maunganui, and as the steamer at last left nearly an hour late a thunder storm burst upon us, and Acland Wansey, who was with us to the last moment, had to make speed to escape the deluge. As we passed the Heads a torrent came in at our port, which was closed but not made fast, and we spent a damp night. The next day was rough and windy and the water dashed over the house on the boat deck. No very comfortable place on board the crowded steamer, as the "lounge" was full of infants and small but noisy children. The weather gradually grew smoother and on Tuesday night I presided at the usual concert where the shipwrecked mariners were enriched to the extent of £8.

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147. GROUP OF ADMIRALTY ISLANDS BOWLS.

Wednesday, Oct. 30. Arrived at Wellington at daylight, but the doctor, as usual, delayed us and it was long after breakfast before we went ashore. Went to the Tourist Bureau and found that Mr. B. Wilson had replaced Mr. Donne who is now in London. He gave us much information and wired to Fairlie to learn the state of the roads to Mt. Cook, for it was very early in the season,

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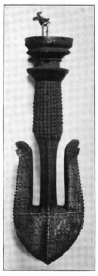
148. DIRECTOR A. HAMILTON.

and the answer was favorable to our journey thither. We also got many guide-books and the promise of photographs. The necessary travel arrangements finished, we turned to the museum, still, unfortunately, in its wooden case in the midst of other wooden buildings. How is it that the progressive New Zealand Government can remain so far behind other, I may say all other, nations in this matter of protecting from destruction by fire collections so valuable as these in this museum? The Wanganui Museum is another example of

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a fine collection of things almost impossible to replace kept in a very combustible building. Surely New Zealand has more of these fire-traps to her discredit than any other country.

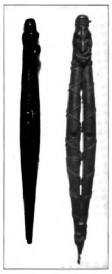
We found Mr. A. Hamilton, the Director, who welcomed us most cordially and proceeded to show us many interesting things, among them a collection of Cook relics from the Bullock Museum[1]



149. MEAT HOOK.



150. PHALLIC STONE DAGGER(?).



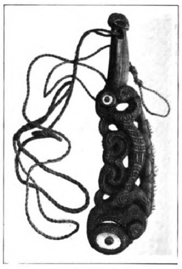
151. MAORI FLUTES.

containing many choice things: feather cloaks and capes, a smal feather Kukailimoku, a helmet and a hat of foreign shape but covered with Hawaiian feathers; of these we have photographs by the kindness of the Director; Tongan club of exquisite workmanship; meat hook (Fig. 149) of unknown origin; phallic stone dagger ([?]Fig. 150); carved Maori flutes, one double (Fig. 151); Maori

[1] Among his possessions Mr. Hamilton showed us a priced copy of the sale catalogue of this old museum with the prices obtained for these very relics in the early part of the last century.

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adzes; a Maori adze 20+ inches long and weighing 12+ pounds; fine shark-tooth sacrificial knife (finer perhaps than those in the British Museum (Fig. 152); two stone kapa pounders of unusual shape and unknown origin; a poi pounder from Tahiti, slightly broken but of the best workmanship (Fig. 153). In the museum also



152. SACRIFICIAL KNIFE.

were many carved receptacles for human bones (18 in all), and innumerable Maori carvings, including several carved houses and many parts of these. A curiously carved stone god of which we were given a cast. Triangular adze like one described by Giglioli; restauration of a Moa; models of a Pah and village. A lot of Tuatara alive and in good condition. The Director's system of storing photographs is very good, mounting prints in pasteboard

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boxes on uniform sized cards all labelled with number of negative. I should think this in addition to my card catalogue of negatives would be ideal, for in a modern museum of ethnology photographs play a very important part. We lunched with Mr. Hamilton at his pretty home near by.[1] After four we returned to our steamer,



153. TAHITIAN POUNDER.

on the way making some purchases for our cold journey to Mt. Cook, and stopping at the Club to which we had a card. Our arrangements at the museum had been very satisfactory, and we are to have a list of all their Cook relics with their history, and

[1] While this report is passing through the press word has come of the death of Mr. Hamilton, but without farther particulars. We may be permitted here to add our tribute to his memory, for the loss is great personally as well as to ethnology. It will be hard to fill his place.

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a number of casts, of which several have already arrived. We are also to have a Maori carved bone receptacle from their abundant store, also some moa bones. The passage out of Wellington was interesting; the channel narrow and nearly crossed by reefs of jagged rocks.

Friday, Nov. 1. Arrived at Lyttleton at daybreak, but did not land until after breakfast, the train for Christchurch leaving at 9:05. Through the long tunnel out upon the plain of Canterbury is always a pleasant change, and the pleasure was greatly enhanced by observing the great growth since my last visit in 1888. The day was cloudy and rain seemed threatening. Exchanged our order for railway conveyance to Dunedin for a steamer passage, as we could find no hotel accommodation in town for the race week and desired to continue on the comfortable steamer Maunganui. We secured our berths on the Mararoa for the return to Wellington; telegraphed to Dunedin for our rooms at the Grand Hotel, and all this took a long time. Finally the tram took us to Papanui, Norman's Road, where Mr. Andrew Roby Bloxam met us and we were soon in his hospitable home. We had reached the place the Trustees wished us to visit for the purpose of examining a feather cloak and other Hawaiian relics, heirlooms in Mr. Bloxam's family from the voyage of the Blonde in which his father and uncle took part. The cloak we found was red, with yellow ornaments, the mesh of the net was unusually coarse but the cloak large and good. This was thrown over Mr. Bloxam's uncle's shoulders by the Hawaiian Queen [Kaahumanu?], and he bequeathed it by will to the present owner. A "stick god" was very interesting and had a lizard head such as I have not seen before (Fig. 159). It was in the Hale o Keawe at Honaunau, Hawaii, when the officers of the Blonde were invited to inspect this famous depositary of the remains of Hawaiian chiefs, and the visitors were permitted to take some of the small idols put there as guardians of the dead. I was kindly permitted to take this home with me for the purpose of casting, to be returned if the Trustees should not care to purchase.[1] The supposed dagger with which Captain Cook was killed turned out to be no dagger, but the well carved handle of a Tahitian fan or fly-flap. It is rather curious that so many supposed daggers

[1] This has since been returned, the completeness of the Museum collection of feather cloaks of this class not warranting any large expenditure for additional specimens.

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(at least four) have been brought to my attention as the actual instruments of Cook's death. In the collection were some small samples of interesting kapa, and two early printed schoolbooks of the American Mission on Hawaii, bound in a rare leathery kapa, the binding being much more interesting than the books. The journal of Mr. Bloxam's father was by all odds the most valuable part of the collection, and I had already by his kindness been en-

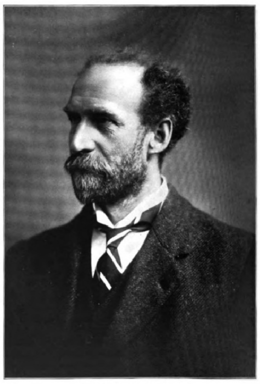


154. CANTERBURY MUSEUM, CHRISTCHURCH.

abled to copy much relating to the visit of the Blonde to these islands, but I understood that he did not care to part with this at present. I had hoped that it might repose in our library in the midst of the group to which most of its contents relate.

After luncheon Mr. Bloxam went with us in the tram some distance, and then we three walked along the bank of the Avon, passing through the yard of the Canterbury Boys School, which has very attractive buildings, to the museum. The river was bordered by willows which had recently been trimmed. All along the houses were homelike, generally of one story with gardens containing araucarias, snowballs, rhododendrons, elders, laburnums

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155. MR. EDGAR R. WAITE.

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and other trees mostly in blossom. This was a renewal of the spring we had found in England, and again in Stockholm. The bright gorse made the nearer hills golden yellow, while in the distance the mountains were still covered with snow, a taste of what we were to have more of later in the New Zealand Alps. The museum was reached at last and Mr. Edgar R. Waite, the Curator, was expecting us. We made with him a rapid survey of



156. PORCH OF THE MUSEUM.

the collections. Some good bird groups; two penguins in the down were most comical; a whale skeleton some 80 feet long with ribs more slender than those of our sperm whale; a cast of *Mesoplodon layardi;* another skeleton of a *Mesoplodon* and a skull with the tusks folded over the upper jaw so that the mouth could only be partially opened. Many Maori carvings not of superior quality, and houses with painted rafters and *raupo* panels and network; leaf baskets for food; fine pigeon pots; some good carved boxes; a rather broad fife and a phallic flute of the common pattern; two mokoed heads; skeletons of Maori and Moriori and many skulls not remarkable. The collection of mounted moa

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skeletons (Fig. 158) was the best in the world, and indeed the museum owes much of its value to the quantity of bones of these extinct monsters which the museum was able to exchange all over the world. I was surprised not to see any attempt to restore the moa, as there are now so many specimens of skin and feathers at hand in the New Zealand museums. The collection of casts of antique statues (this museum is a general one, but I was not able to go



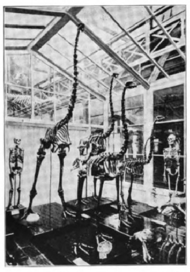
157. MAORI HALL IN CANTERBURY MUSEUM.

beyond the Pacific region on this visit, with this exception) was good and contained most of the gems. Good labels on the objects, which were printed in the museum. The library contained many books of which we ought to have copies. Hoping to see more on our return we telephoned for a taxi and rode rapidly into town to take the 4 P.M. train to the port. As we passed out into the ocean there was some motion which soon subsided as we got on our course, and as the wind abated it was very pleasant on deck. Early Saturday morning we were in the inlet that leads to the city of Dunedin and after breakfast were at the wharf where we took our last view of the good steamer Maunganui. The weather was cold and the sky overcast, but certainly the town looked well as we approached. The houses were low, painted white, and very neat. Our luggage

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was taken up by an express, but we walked the short distance to the Grand Hotel. Installed in a good front room on the first floor, we first went out to arrange with that capital institution the New Zealand Express whose good offices I had availed myself of on several former visits, to take our trunks to Rotorua on the north

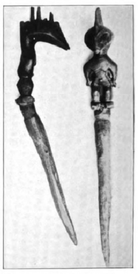


158. MOA SKELETONS IN CANTERBURY MUSEUM.

island; did a little shopping, examined the streets and got back to lunch at one, after which we took a hansom to the museum (Fig. 160), where we found Professor W. B. Benham, the Curator, who received us courteously and we spent most of the afternoon examining the collections. One hall was devoted to the Hockens collection of Maori carvings, clothes and implements. Within the museum was also a good lot of books and engravings given by the same benefactor. The collection of moa skeletons

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(a fine one) was supplemented by specimens of feathers, skin, tracheal rings, and even a leg still clothed with muscular fibre, from cave excavation; also a genuine egg. As Dunedin was once a centre of the whale fishery it was not surprising to find many remains of whales, among which a capital cast of a very young rorqual was prominent. A huge Queensland crocodile, at least a third larger than ours, was too much "stuffed". A fine *Notornis*, one of the three known, was a great attraction, and in the same case was a specimen of the extinct wren. A good ribbon fish (the dorsal fin scarlet and the body silver) was seen. An extensive collection of worms and radiates of which Professor Benham is a specialist was most interesting. The case containing supposed Cook relics had a damaged Mangaia paddle, a fine Tongan club, and other possible relics, besides the impossible Solomon Islands clubs, etc. A fine Admiralty Islands bowl measured 39.5 x 41 inches in diameter. There were many Santa Cruz sashes and looms.



159. GOD IN BLOXAM COLLECTION.

This museum is an adjunct of the Otago University, so that it bears the same relation to the university that the Canterbury Museum bears to the University in Christchurch. Professor W. B. Benham, Sc.D., F.R.S., is a professor in the university as well as curator of the museum, and hence the character of the collections is more or less moulded by the scholastic connection. The collections given by Thomas Morland Hockens were not only of great importance, as collections of books, paintings, engravings, ethnological specimens, but, as told in the annual report of Dr.

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Benham for 1907, proved an incentive to a general public interest in the museum resulting in a very considerable subscription to pay for a suitable wing to the museum for the housing of these treasures. After leaving the museum we took a tram to the Public Garden, which was very attractive in its spring garb (the tulips were still in evidence), and a good rock garden claimed much attention. Large and symmetrical arbor vitæ trees and the close-leaved oaks

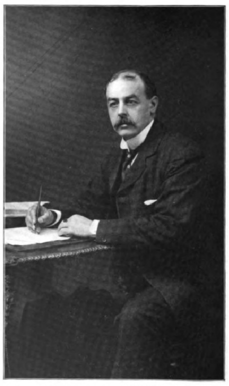


160. OTAGO MUSEUM, DUNEDIN.

gave character to the foliage. Black and white swans and beautiful ducks were in the pools extending through the grounds. The glass houses were closed, but we could catch glimpses of a good collection of indoor blossoms.

Sunday, Nov. 3. Bright early in the morning, but before our nine o'clock breakfast the sky was overcast, brightening again in the afternoon. My lameness was very bad, but I walked with Mr. Wilson almost across the town to the Knox church. No public vehicles are allowed to run before 1 P.M., and the walk was a long and very painful one. The exigencies of travel had given us few opportunities of church going, although we availed ourselves of all possible, and now we found the services long, uninteresting and very unprofitable. Apparently none of the Geddes family were

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161. DR. W. B. BENHAM, CURATOR.

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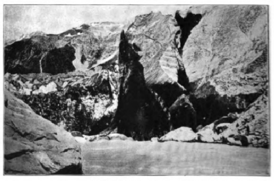
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present, and the worst part of John Knox presided. The theme was the absolute need of mysteries in religion, and if the miraculous birth of Christ, His resurrection and purchase of our souls by His death was eliminated (which was quite possible by the rational method) the Christian religion was not worth fighting for! The claim was made that death was an eternal rest from labor! The Sunday dinner was at 1:30, and the day ended in hard rain.

Monday, Nov. 4. Rain continued and we took the early train for Timaru where we arrived at 1:37 and found some tea in a small shop not far from the station. It was too wet to move about and the accommodation at the station was nothing to speak of, but luckily the train leaving for Fairlie at 3:55 was on a side track, and we occupied our seats with some comfort until our arrival at Fairlie at 5:30 where we found our room at the little Hotel Gladstone, whence our ride of ninety-eight miles to Mt. Cook was to begin on the next morning. Early on the 5th after examining the fine machinery (all American) in the company's garage and securing our seats, Mr. Wilson in front and I directly behind him, we started. The weather seemed brightening and before long cleared. For miles there was a golden hedge of gorse or broom, nor were these attractive shrubs confined to the hedgerows, but appeared in clumps to brighten the rather dull landscape. At the first "public" our two fellow-passengers were joined by an old fellow, and the three began a series of drinks that lasted as far as the last "public" and reduced the two original passengers to drivelling idiocy, while the old fellow seemed tougher and kept enough sense to name the places to his drunken fellows, but he was left at Pukaki where we found a good luncheon and were waited on by a little daughter of our landlady, while our drunkards fortunately lunched or drank elsewhere. The place of the old fellow was taken by a fat little drunkard who continued much of the way with us, and with tobacco and drivel made the journey as unpleasant as possible. While the scenery was not attractive the first thirty miles, it changed from Lake Tekapo and we were soon in a ring of snow-capped mountains, and these bright peaks continued to Lake Pukaki and to the end. Just before we reached this lake we saw perhaps the most beautiful view of Mt. Cook (native Aorangi, the heaven-piercer) across the water. The peak was clear and the banks of cloud on either side were bright in the afternoon sun.

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Fig. 163 gives a faint idea of this fine mountain we intended to see closer at hand. Our way on lay along Lake Pukaki which had the true glacial tint. About three miles from the hotel we had a "blow-out", but this did not delay us long. I was surprised at the smoothness of the roads in this region far from habitations; where we had to ford a brook the bottom was firm and gravelly. The Hermitage was neat and attractive, and our rooms gave us views of the mountain tops. Two agreeable ladies were the only



162. FRONT OF THE MULLER GLACIER.

guests, for it was early in the season. As soon as we were settled our host, Mr. Cook, took us a short walk to the Hooker River and the Müller glacier front (Fig. 162); as we were returning we were fortunate in seeing an avalanche on Mt. Sefton before we heard its thunder. We had a letter to Peter Graham, the guide, whom we met on this walk; a fine young fellow whom one would like at sight.

Wednesday, Nov. 6. The morning was lowering, and a severe cold added to my lameness decided me to let my secretary go to the Tasman glacier without me. This glacier is fourteen miles long, one of the largest out of Arctic regions. So after a proper outfit of shoes and spats my companion started on horseback with the guide Thcmpson to pass the night on the ice. I put on my sweater

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and strolled up a near valley, climbing over a moraine and up until I got a fine view of Mt. Sefton with its ice-wall and frequent avalanches. It was not easy walking, and I doubt if the exercise did me much good. Few flowers were seen, but some interesting rock and tree lichens and two attractive ferns. Moraines are not to my taste as pavements. I, however, had a better opportunity than ever before to note the action of ice and pulverized ice in the rapid erosion of these mountains. Avalanches at the rate of three or



163. MT. COOK.

four in an hour; the "dust" arising like smoke, the powdered ice descending the steep ravine, often by leaps, closely resembled milk, and although dry as snow seemed from the distance a perfect fluid. On my return the rain began to fall and continued most of the afternoon. The ladies had planned to cross the pass to the west coast with Peter Graham and his brother, and in spite of the weather started after tea on foot for a twenty mile walk to the hut where they were to pass the first night. A bright wood fire was most comfortable in the parlor and I ate my dinner alone. The night closed in still raining steadily.

Thursday, Nov. 7. Bright and clear. After a solitary breakfast Mr. Cook and I walked to Hooker Valley, crossing the rather

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narrow suspension bridge which required careful walking to avoid unpleasant oscillation in the middle. We went along by the Müller glacier and turned aside to see the Hooker stream run under the glacier (Fig. 165). It was hard at first to believe that the dark, gravel-loaded mass was ice, it was so covered with sand. Every now and then a block (a miniature iceberg) would break off and show its true nature. The sides showed numerous protruding pebbles and boulders like plums in a pudding, and farther up the

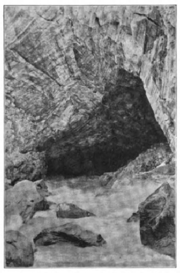


164. BRIDGE OVER HOOKER RIVER.

mass was seamed deeply with transverse cracks. In the Hooker Valley were thousands of the beautiful white buttercup, called here, absurdly, "Mt. Cook lilies" (*Ranunculus Lyallii*). It was not difficult to distinguish two species of this interesting plant, but as I supposed Dr. Cheeseman (whose excellent Flora I had not with me) had described it, I took no pains to preserve specimens. On meeting Dr. Cheeseman later in Auckland I found that he had visited this region two months later than my visit and doubtless the flowers had perished from one of these. One may have been *R. Traversii* which has not been reported for forty years. New Zealand is rich in this genus, Dr. Cheeseman describing thirty-seven species.

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Friday, Nov. 8. The morning was wet and apparently it had rained all night. Mt. Sefton was covered with cloud as long as we remained, but at 6:30 there was a bit of sunshine soon covered in again. At 8:30 it was dry enough to put up the auto curtains and we started with the good-byes of the whole establishment.



165. HOOKER RIVER PASSING UNDER MULLER GLACIER.

All had been hospitable and helpful, and we were sorry to leave. All day the sun shone bright, but as we looked back we saw the Hermitage was veiled in a heavy shower. The stone and gravel roads here are not injured by rain unless it be heavy enough to actually wash them away. A peculiarity of the road building is that bridges light and narrow are provided for motors and light vehicles, but heavy eight-horse teams and traction engines have to

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ford the streams, which are generally shallow with gravel beds. The storm of the previous night had put snow caps on the hills near Fairlie, which were bare when we passed up two days before. At Pukaki we lunched, and as we got to Lake Tekapo before time we had a good cup of hot tea in the hostess' private parlor. Behind one of the abutments of the bridge was a thrifty apple tree in full blossom; the broom also had largely blossomed out since we went up and was more attractive than ever. We arrived at the Gladstone early and found the proprietor and also a much better room than we had before. The drive was very cold all the way except in the sun. The next morning left at 8:30; had a good run to Timaru and sat in the train until the arrival of the Dunedin train which was half an hour late. We passed a train with seventeen cars crowded with passengers returning from the races, also two supplementary trains. The hills were snow-capped all the way to Christchurch and during the afternoon there was considerable hail. Arriving at six we went to the United Service Hotel (not a fortunate selection).

Sunday, Nov. 10. All the forenoon was rainy and I sat in my overcoat trying to keep tolerably warm, but at noon the weather cleared and at two we took tram foı Mr. Bloxam's where we found Mr. J. C. Adams, the chairman of the Board of Governors of Canterbury College (University of New Zealand); soon Mr. Waite, Mr. Cocagne and another gentleman joined us, and after a pleasant chat in the diningroom we had afternoon tea in the parlor, after which Mr. Bloxam and I adjourned to the diningroom to discuss the collection of Hawaiian antiquities the Trustees of this museum wished me to examine. The final price put upon the collection proved, as I expected, greater than the museum cared to pay. We spent a most agreeable evening, reaching our hotel at ten. Monday we walked to the museum and spent a pleasant hour or two with Mr. Waite; then were taken to see the hall of Canterbury College, and finally took the 5:25 train for Lyttelton where we embarked on the Mararoa, the same steamer in which I had journeyed from Auckland to Melbourne twenty-four years before. There was the usual overcrowding on New Zealand boats, greater than I have ever seen allowed elsewhere, much rolling and many sick, but we both

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escaped without a qualm. Arrived very early at Wellington next morning, and after a cup of tea went ashore where we found trouble in getting a breakfast at so early an hour, but at last found some fried eggs and coffee, and by nine called on several friends but found none in office, and spent the rest of the morning with Hamilton at the museum, walking to the railway station where we took the 11:50 train on which we had an excellent lunch in the "refreshment" car. The road was good through the hills, and the scenery attractive all the afternoon, and we arrived at Okahune under the shadow of the grandest group of active volcanoes in New Zealand—Tongariro, Ngauruhoe and Ruapehu, at 9:10 and our traps were taken in a wheelbarrow to the Windsor Hotel near by. Some years before I had approached these volcanoes from Lake Taupo on the other side, and they were then more active than at present. The night was quiet and the morning very cold as we breakfasted and took the train at 6:27. We had fair seats but the scenery was wholly changed from that of the previous day. It was a new roadway and on both sides was a wide swathe of burned forest only relieved later by the huts of squatters and a crooked river, said to be the Wanganui, but here flowing to the north. We passed many stations, changing cars at Frankton Junction, and, after considerable delay got a train on the old road from Auckland to Rotorua where we arrived just before six, and after an unpleasant ride in a crowded vehicle came to the Grand Hotel where we found a good room and a capital dinner awaiting us. The azaleas on the tables were most beautiful and the rainbow trout delicious.

Thursday, Nov. 14. Rain in the morning but we got about between showers, and with the sunshine it was much warmer. After luncheon we took the omnibus for Whakarewarewa, but it was miserable enough; crowded to suffocation and one pipe-smoker seated in the lap of another of the same breed; although there were a number of ladies, two of them invalids, the eight or more brutes never so much as asked if the reek was disagreeable! We got there at last; two of the Maori guides, with tatued chins, hanging on outside all the way. The place was utterly changed; no entrance fee and little need of guides, for the once pretty village had become a public park abounding in broad paths, bridges and seats,

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but no geysers! The natives who once thronged the place and gave it life and interest had moved away; Maggie, the famous guide, had married a millionaire Englishman and was living in England and her fine little house was closed. On the hill the Pa, so graphically described by Mr. Hamilton,[1] with its carved houses, watch towers and gateways had been reerected on the hill, but this relic of the Christchurch Exhibition is now looking tawdry and in



166. MUD VOLCANO, WAIOTAPU.

decay, and hardly recalls the fine account given by Hamilton. Graves were prominent, but with the geysers and hot springs dead, the whole place seemed to me a cemetery. At my last visit all the many varieties of natural fountains were in most energetic action, and my then companion Acland Wansey and I had to be on our guard against the hot spatters coming every now and then from basin or crevice. Have these springs followed the Maori inhabitants or are they simply resting? The destruction of the Terraces in the eruption of Tarawera a dozen years ago; the spoiling of the mighty Waimangu geyser, the largest in the world (1800 ft.) by

[1]Bulletin 3 of the Dominion Museum, 1911.

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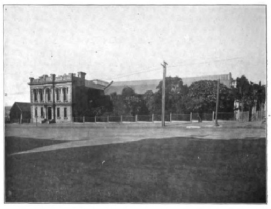
partly draining the neighboring lake, and now the extinction of the "*Grand Eaux*" of Whakarewarewa are lamentable even from a tourist view. The interesting modern specimen of a Maori carved whare, formerly so attractive under the guidance of Maggie, has been sold to Germany, and that country seems at present to have more specimens from the Pacific region than have all the rest of Europe and the United States.

Friday, Nov. 15. We had made arrangements and at 9:30 a fine Napier car, six-cylinder, forty-horsepower, was at the door for us. The weather was all that we could expect and we were amply protected from the cold wind. The road was vastly improved since my last trip and we traveled fast. Rainbow Mountain was fine but the plain that sank at the Tarawera eruption and earthquake was not noticeable, as the abrupt edges had worn down greatly. At Waiotapu we lunched, having stopped to see by the wayside the mud volcano which was in good action. On we went, arriving at Wairakei at 2:30, a fifty mile ride. The guide was hunted up and by three we were tramping on the trail to the valley of hot springs a long mile away. We began at the lower end of the exhibition where we found the "steam hammer" was muffled by the full creek; however, the various geysers did their duty fairly and Mr. Wilson took a number of shots in the bright sunlight. At the "paint pot" the guide obligingly made me a palette of the various reds, browns and blues found in the layers of the bank. The colors are still bright after twelve months. The champagne pool was too full and active to show its fine blue color and sparkle. The mud pool was very glutinous and "good for rheumatism", so I carried off a small sample of the mud. After three hours we hobbled back to the hotel very weary. The native sweet clematis (*Clematis indivisa*) was in blossom over the bushes on the way.

Saturday 16th. Fine morning and the car was ready at nine, but my secretary, with his benevolent scent, had found a man and his wife whose name he did not know who preferred our car to the stage as a comfortable means of getting to Rotorua, so there was nothing for it but to let them have seats. The car stopped at the Aratiatia rapids, but I remained in my seat while the others climbed up to the show. This took nearly an hour from our time and we got to the usual lunch place at 11:40 and had to wait there about

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an hour. We finally got to Rotorua at 2:15, tired and dusty. It seems as if the activity of this region as well as that of Whakarewarewa was diminishing, but in this case I should not form a definite opinion as the water is high and may affect the action. In the latter region, as I have already stated, the action is almost negligible. It has formerly been possible to start the action of Wairoa



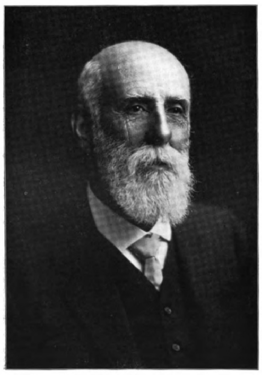
167. AUCKLAND MUSEUM.

(great water) by soaping, but this time it had no effect on the geyser soaped but did start up some action in another orifice to an extent sufficient to have the news telephoned to the hotel. In the afternoon of Sunday we walked to the park and saw the finest growth of azaleas and rhododendrons yet seen. One clump of dark pink azaleas was at least 12 feet in diameter, and some of the rhododendrons were 15–20 feet high. These were growing in a bed of clay closely resembling mortar.

Monday, Nov. 18. Train left at 9:30; windy and dusty all the way, arriving in Auckland at 5 P.M.; certainly a slow train. Although the New Zealand railways have improved in the matter

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168. DR. THOS. W. CHEESEMAN.

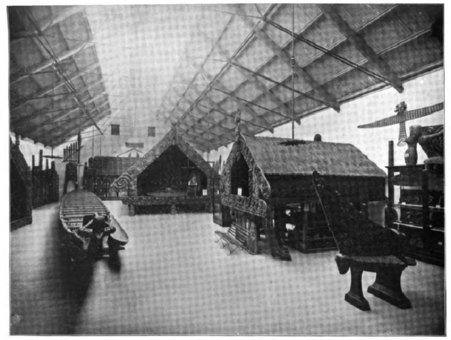
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of cars since I first tried them twenty-five years ago, they are still slow, running long trains with long stops, even "express" trains stop at nearly every station. The next day we were early at the museum where Dr. Cheeseman received us most cordially and showed many acquisitions, among them the "Spencer" carvings which I had tried to buy on a previous visit but the owner would not sell; and a superb native house which was procured at a bargain and now forms a wing of the canoe hall; the roof and raupo paneling were, of course, new. The whole arrangement has greatly improved since my last visit, and it is probable that the remainder of the art collection will eventually be removed to the art gallery, giving much needed room.

We also visited Partridge's gallery of Maori portraits, nearly doubled in number since I last saw them. Partridge was telephoned and he came to see me and told much of the work of the artist Lindauer, who is now an old man and has retired to his home at Pilsen in Bohemia. This collection is certainly the best representation of the Maori race in existence, and consists not only of portrait heads but characteristic groups of great artistic and ethnographic merit. I know of no Polynesian race that has been so finely illustrated. I wish it could be exhibited in this museum and elsewhere before it is settled in its final resting place, which should be New Zealand if any thoroughly fire-proof museum could be found.

Wednesday, Nov. 20. Fine day, and we walked through Albert Park; the color arrangement of the beds of flowers was bad. Visited the library and found the art gallery closed for alterations, but the librarian, Mr. Shellington, kindly sent to the Mayor and got his permission to let us in. The pictures were all down and the "Landing of the Maoris" which I much wished to see again was in the pile face to wall. In the table cases, however, were many relics of the Sir George Grey collection (whose books and manuscripts form the choicest, if not the largest, part of the public library). Among these a two-pronged shark hook; many fine meres and patus; superb boxes and many ear-rings. A Hawaiian poi pounder of large size, a large adze, kapa beater, niho of a palaoa were noted. Two Maori jumping-jacks; genealogical sticks and other interesting and rare things. In the afternoon drove to Mt. Eden, Cornwall Park, Remuera and the Domain. Apart from

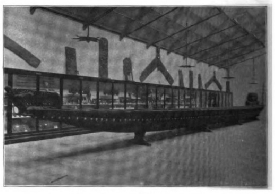
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169. VIEW OF PATAKA, AUCKLAND MUSEUM.

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the good roads, nothing made more impression on me than the wonderful growth on the plains beyond Mt. Eden, in the few years since I last saw it. Then two or three scattered houses, now what almost resembled a military camp so close were the cottages, to which a fine new avenue with double tram tracks gave convenient access from town. From Mt. Eden one could once count more than fifty volcanic cones, but now many of these are concealed by



170. WAR CANOE.

buildings and cultivation. Auckland is certainly fortunate in having such agreeable drives and charming views within her bounds. There are few if any American cities of its size that have so excellent a public library.

Thursday, Nov. 21. We went early to the museum and had a pleasant and instructive morning with Dr. Cheeseman. The morning of the next day was partly spent in moving into the steamer "Zealandia" which arrived in good time from Sydney, bringing our trunks and deck chairs, and our stateroom was so full that the steward gave us another near by for my secretary, and we again had a room each. We then turned to the museum, of which it was

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171. FIJIAN LALI OR WAR DRUMS.

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hard to get enough, and at 12:45 accompanied Dr. Cheeseman to a lunch at the Northern Club given by Mr. C. C. McMillan. Among the guests were the U. S. Consul-General Mr. Wm. A. Prickett, and three others, one a trustee of the museum. It was a very pleasant occasion and I sat on our host's right hand. We went on board early but the boat did not get away until 6:30.



172. FIJIAN POTTERY.

Monday, Nov. 25. Warmer, and we arrived at Suva at 11 P.M. Early in the morning a carriage was secured and we started promptly for our drive. First up the hills back of the town to the pleasant residence of one of our fellow-passengers, Hon. Jas. Borron, who had asked us to look at his native curiosities; then about the town on fine, hard roads, stopping at the museum newly established by the Fijian Society and the Government. In this we found many interesting things, and the secretary of the society, Mr. C. Wall, kindly showed us what we were most interested in. On the stairway was an immense roll of sennit, and some others about a yard high; these were in former days used in house building and deco-

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173. THREE FIJIAN PRINCESSES.

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ration, often used to cover important beams in woven patterns of two colors. There were many of the yaqona bowls, some carved in turtle form. Needles for sailmaking formed from human bones. Clubs of various forms in great number. Many specimens of the beautiful madrepore corals common on the Fijian reefs. In fact there were the foundations of a good local museum.[1] Near by was the Carnegie, both well situated on the shore of the bay.

To show how the old time is passing I insert a figure (171) of the modern use of the ancient *lali* or war drums. The advocates of universal peace should feel encouraged when the fierce Fijian former cannibal and all-the-time warrior has come to this! Swords and spears must soon follow to plowshares and pruning hooks. A harsh dull roar those old drums used to make; they are better food bowls or horse troughs. The number of Hindus about the town of Suva indicates that, like the Japanese on these islands, the field laborers when they get a chance move into town to engage in quieter, easier and more profitable work. More of the native canoes remain than can be found of Hawaiian make on Hawaiian Islands: but here the intercourse between islands and even villages is still by the old means of conveyance. We also drove by the Domain and Botanical Garden, returning to town to gather a few good photographs. The town has greatly improved during the past few years; a large concrete hotel is nearly finished on the water edge. At 11:30 we departed.

Tuesday morning we were in sight of Alofa and Fotuna, the latter so near that we could plainly see the fine white beach and coco palm plantations. Early on Thursday (Thanksgiving Day), we passed Hull's Island, rather large with an extensive lagoon, the borders rather narrow. The captain invited me to the bridge to see all that was possible. The opening on the west is not for ordinary boats, although they could be hauled over. There were trees and shrubs with many coconuts. About noon we passed Birnie, a small white island with grass but no trees; a stone beacon is a good landmark. We passed to the east of Hull but to west of Birnie. Took Mr. Wilson on to the bridge with me; at four we

[1]Since my return, in trying to arrange an exchange with this museum, I have learned from the president of the trustees that much of their material is loaned, and there are no duplicates for exchange.

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passed Enderby, the last of these line islands. No lagoon but the island has been worked for guano. Several rectangular mounds were seen; some dark green trees; a row of coconuts on the northwest; wreckage on the south point, and the bows of a steel vessel of small size on the eastern shore.

Early in the morning of December 3rd we arrived at Honolulu on the date I had fixed in London, so exact is modern travel when undisturbed by storms or accidents, from all of which we had been mercifully preserved.

After some weeks rest, including a visit to the volcano of Kilauea and drives about Oahu, and a careful study of the Bishop Museum, Mr. Clarence M. Wilson, my faithful secretary and agreeable companion, departed to examine for me certain American museums it had not been possible for me to visit in my hurried trip across the continent to catch the steamer at Boston whence our joint journey began. The notes he has sent me, added to more or less knowledge gained on former visits, will complete the chain of museums for this report.

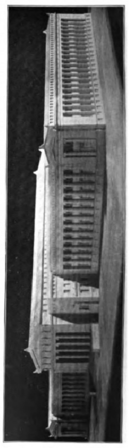
In Chicago the Field Museum of Natural History (formerly the Field Columbian Museum), of which Frederick J. V. Skiff is Director, was visited, and in the absence of the Director, Dr. C. F. Millspaugh, Curator of Botany, acted as host and showed all things desired. This great institution is experiencing all the trouble and confusion of unsuitable and outgrown quarters, but compensated in great measure by the knowledge that a far better building (Fig. 174) is soon to take the place of the present unfit and almost ruinous structure, a relic of the Columbian Exposition. Preparations are being made and specimen groups are being stored in anticipation of removal, so it is not a suitable time to report the condition of the collections. The few from the Pacific region on exhibition are listed in the sequel, but many are stored for study or preservation. I do not find great accessions in this department since the last visit of Dr. Brigham (as shown in his lists), while from neighboring regions the ethnographic collections have considerably increased, for example, Mr. Robert F. Cummings made it possible to purchase a fine Philippine collection. [Except in Holland these specimens are very rare in museums.—W. T. B.]

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In general botany the exhibits are greatly improving as seen by the methods used in exhibiting trees and their products (Fig. 176); the glass preparations of fruit and flowers (Fig. 177). Some of the latter leave little to be desired in scientific and permanent preparations: a specimen of *Agaricus* rising through grass strongly impressed our Director. The superb collection of glass flowers in the Agassiz Museum at Cambridge does not surpass this work.

The "dry aquaria" did not make so good an impression, but the bird groups (Fig. 178) are of the best quaility. As was to be expected, the Polynesian exhibit was small, but even there were some choice specimens, for example, the fine ceremonial paddle from Mangaia, of a pattern seen only once elsewhere, and shown in Fig. 179.

After our experience with the steel cases of the new instalments in European museums we were rather inclined to criticise the use of wood in the cases for the new building, but it must be admitted that if wood is to be used, it is well used here. The neatness also of the labels is noteworthy, and that in a museum which must always be educational is of great importance.



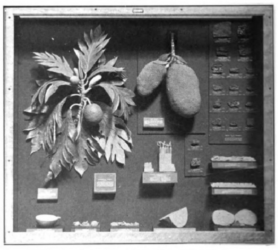
174. FUTURE FIELD MUSEUM.

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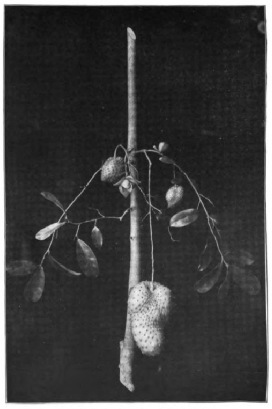
175. DR. C. F. MILLSPAUGH, CURATOR OF BOTANY.

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176. CASE OF BREADFRUIT AND DERIVATIVES.

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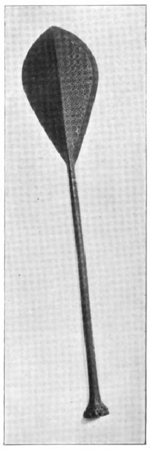
177. SOURSOP FRUIT AND FLOWER IN GLASS.

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178. GROUP OF AMERICAN TURKEYS.

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179. MANGAIAN PADDLE.

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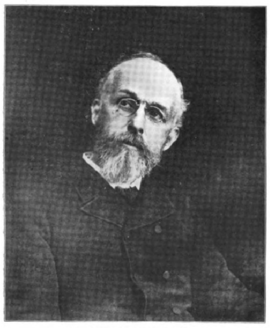


180. MARINE MUSEUM.

SALEM, MASS. Peabody Academy of Science: Museum of the Salem East India Marine Society. [By W. T. B.]

Founded in 1867 by George Peabody. It occupies the building of the Marine Society (founded in 1799), and has the museum founded by the East India merchants who made Salem one of the richest of the Massachusetts towns. Their ships brought in from the Pacific in the early years of the nineteenth century much choice material. Some of the kapa specimens have already been illustrated in the *Museum Memoirs* (Vol. III). The natural history collec-

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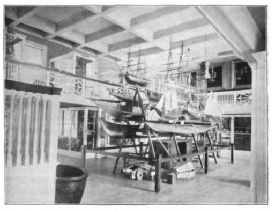


181. EDWARD S. MORSE, DIRECTOR.

tions of the Essex Institute are deposited here. The moving spirit in all these has been Edward S. Morse, and while his interest has been mainly biological and artistic, he has always been ready to assist in any ethnological matter, as I have found to my advantage. The museum rooms do not show the very latest styles in cases, but are painted white and so are light, while the collections are well arranged, and carefully preserved. The third of the great Hawaiian images (Fig. 248) is here, the others being in the British and Bishop Museums. [385]

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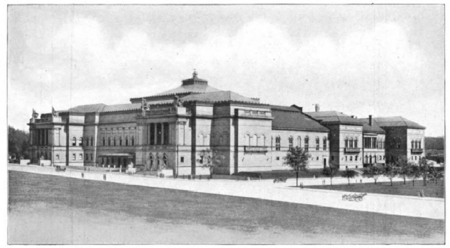


182. INTERIOR OF MARINE MUSEUM, SALEM.

PITTSBURG, PENN. Carnegie Institute; Carnegie Museum, Dr. W. J. Holland, LL.D. Director.

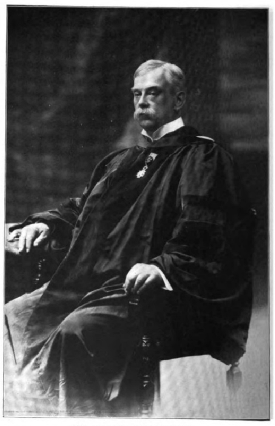
The Carnegie Institute of Pittsburg was originally founded as a library with audience hall and art gallery; later a museum developed as told in the report of the Director for the year ending March 31, 1898. This is the only portion of this Institute in which we are at present interested, and to the Director, Dr. W. J. Holland, we owe a list of the Pacific ethnological matters as well as a fine series of large photographs covering the whole Institute, from which I have selected three which show the general arrangement of the natural history rooms and the main building. In Fig. 185 is seen the famous *Diplodocus carnegei*, casts of which I had seen in European museums, and on the right a cast of the *Dinornis giganteus* of which the Trustees of the Bishop Museum declined to purchase a copy. As will be seen by the lists given in the sequel, Polynesia is hardly represented, but New Guinea has a very fair representation in certain lines. The Carnegie Museum has also a considerable collection of Philippine material which does not come into our region. From time to time many good collections have been purchased or given by the founder. As in the case of most museums, a financial statement is appended to the annual report of the Director.

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183. CARNEGIE MUSEUM, PITTSBURG.

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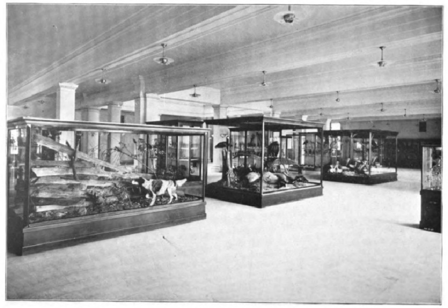
184. DR. W. J. HOLLAND, LL.D.

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185. PALAEONTOLOGICAL ROOM.

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186. HALL OF MAMMALS.

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187. THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA.

PHILADELPHIA, PENN. Academy of Natural Sciences. Founded 1812. President, Samuel G. Dixon.

This, the oldest natural history society in the United States, has grand collections, especially of birds and shells. In Pacific ethnology it had the advantage of the collections of Titian R. Peale of the U. S. Exploring Expedition, and so has choice specimens of kapa from Hawaii of which this museum has received generous samples (See *Hana Kapa*, *Memoirs*, Vol. III). Miss Wardle has for some years had charge of the ethnological department.

NEW YORK. The American Museum of Natural History. Frederic A. Lucas, Director; Dr. Clark Wissler, Curator of Anthropology and Ethnology.

The American Museum in New York is, in more respects than I can enumerate, an example for all others; and that is not saying that it has no faults. It is not necessary to give a detailed account of its size, contents and activities, for these can be learned from the excellent journal, guides and handbooks distributed at less than cost and well illustrated, but a few items of a statistical nature may be of use to those directors of museums at a distance who have not visited New York.

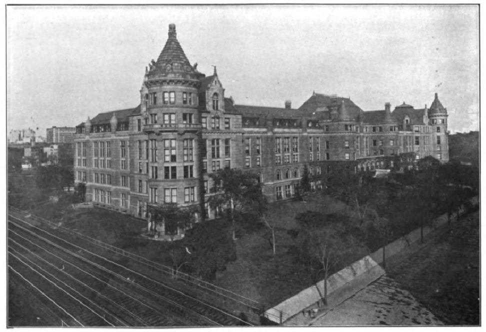
The present building in Manhattan Square was started in 1874, and three years later the first section was completed. At present

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188. MISS WARDLE.

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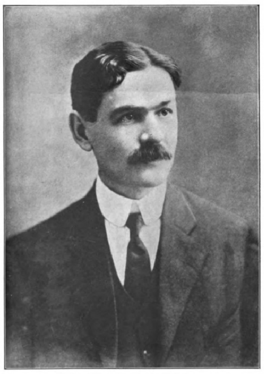
189. AMERICAN MUSEUM, NEW YORK.

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190. HENRY F. OSBORN, PRESIDENT.

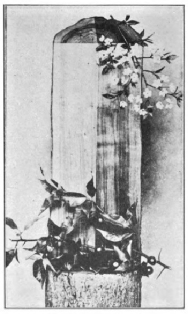
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191. CLARK WISSLER, CURATOR OF ETHNOLOGY.

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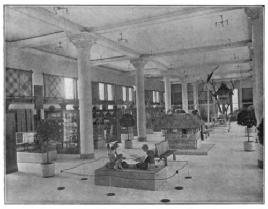


192. WILD PLUM IN JESUP COLLECTION.

the south façade, which is 710 feet from tower to tower, is shown in Fig. 189, and the building has cost approximately $5,000,000. The total area of floor space is about ten acres (470,789 square feet), of which about half is open to the public. The building is erected and largely maintained by the city: the annual appropriation is devoted to the heating, lighting, repairs and supervision of the building and care of the collections.

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193. PHILIPPINE ROOM.

"The museum is under the control of a self-perpetuating Board of Trustees, which has the entire direction of all its activities as well as the guardianship of all the collections and exhibits. The Trustees give their services without remuneration.

"The funds which enable the Trustees to purchase specimens, to carry on explorations and various forms of scientific work, to prepare and publish scientific papers and to enlarge the library, are raised by contributions from the Trustees and other friends. These contributions come from three sources, namely, (1) the Endowment Fund, (2) Membership Fund, (3) voluntary subscriptions. There are at present about 3500 members. Annual members contribute $10 a year for the support of the museum; life members make a single contribution of $100.

"The scientific side of the work of the museum is based upon its explorations and study collections.

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194. PACIFIC ISLANDS HALL.

"In the case of Natural History the vast majority of the specimens are in the study series, not only because they would ultimately be ruined by exposure to light, but because the display of all the material would only confuse the visitor."

Of the study collections the ethnological includes matters of most interest to this Bishop Museum, and we find that there are thirty-three fire-proof storerooms on the attic floor of the west wing where are stored more than 100,000 catalogue numbers of specimens from the Philippines, Siberia, China, "South Sea" islands, Africa and North America.

Of the exhibits several may be named of which I have not seen the equal in any of the great museums I have visited. The Jesup collection of North American woods, of some 500 specimens, one of which, the wild plum, is shown in Fig. 192 with blossoms and fruit: even Kew cannot show anything to surpass

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195. CORNER OF PACIFIC ISLANDS HALL.

this. The gem room is another notable collection. Groups of birds, animals, and even the lowest forms of animal life are exhibited most attractively, but the palaeontological collections are perhaps the most advanced in the world, not merely in number, but in the remarkably intelligent exhibition; the dead bones are again alive! I have spoken in a former report of this and the labeling and need not repeat here. The series showing the evolution of the horse is but one of the choice things in this wonderful collection.

Naturally the ethnological collection from the Pacific islands interested us especially, and I confess it is very disappointing. Why do the museum authorities call these islands "The South Sea Islands"? Surely they are aware that the term "South Sea" as applied to the Pacific is no longer used by geographers, and the term "Sandwich Islands" has not been correct for more than three-

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196. THE AMERICAN MUSEUM OF THE FUTURE.

quarters of a century, and the Hawaiian Islands are not in the South Pacific. I do not wish to be too critical, but where do the islanders weave mats for *roofing* houses as mentioned in the guide? Polynesian, Micronesian and Melanesian matters are mingled as they seldom have been in nature. The statements about the feather cloak of Hawaii exhibited are incorrect, as the greater portion of the cloak is of red feathers, the commonest and cheapest of all, as the *iiwi*, which produces them, is found all over the Hawaiian group, and it is only the orange feather of the *mamo* of which the great value may be predicated, and there are none of the feathers of this extinct bird in the cloak exhibited. Red feather cloaks were by no means confined to the priesthood, nor yellow (of the *oo*) to royalty. The Hawaiian feather garments were kept in the dark except on the rare occasions of their public use, or they would have faded, as they do in the museums where they are displayed in full light.

The Robley collection of mokoed Maori heads is the most complete in the world; but the specimen of Maori cast brandishing his mere or patu on a mass of *pounamu* does scant justice to the

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finely formed New Zealander. The lists given later (imperfect as they are) will show that there are fine Polynesian and Melanesian things in this museum, but they are unbalanced and cannot show the life of the natives of the Pacific as are shown that of the American Indians and to a less extent of the Filipinos.

The workrooms in the basement are provided with the best machinery, and the workmen employed are many of them very expert; the casts, wax and glass models, the taxidermy, and even some of the cases for specimens are made within the walls; so that the student of museum work can perhaps learn his profession here better than elsewhere; so far as I have seen there are no other museums whose activities are so complete and varied.

UNITED STATES NATIONAL MUSEUM. Richard Rathburn in Charge.

Since the present report was written the Assistant Secretary of the Smithsonian Institution, Richard Rathburn, has published, as No. 80 of the series of the Institution Bulletins, "A descriptive account of the building recently erected for the Department of Natural History of the United States National Museum." This volume of 125 pages and many views and plans is a most interesting description of the building, of which Fig. 2 of the present report is an illustration.

The water, light, heat, cold and ventilation are provided for within the building, and the result is a museum of remarkable mechanical and architectural engineering. The storage arrangements seem complete and abundant, but the exhibition halls as figured are not attractive; there is a democratic simplicity about the cases (shown in plate 20) which verges upon the ugly, and surely the row of table cases would be more in place on the back porch of a pioneer's log cabin than in the national museum of a great nation; at best they are poor settings for gems and the fine collection of minerals.

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Conclusions Drawn from What Has Been Seen.

I may repeat what I have had occasion to mention before, that in very few cases have I found difficulty in entering the various museums I wished to see; the directors have always readily opened their treasures to me, sometimes at no little inconvenience to themselves; in a few cases I have unfortunately arrived at an unsuitable season during the absence of the director on summer vacation, and there has not always been a substitute empowered to open closed doors. This was especially the case in France and Italy which I visited in July and August.

Where I had seen the museums in 1896 I found generally most agreeable changes, not merely in accumulation of new material (this process has, as I have remarked, overwhelmed the Berlin Museum für Völkerkunde) but in the better building, casing, installation and labeling[1] of specimens. Museum authorities are learning that architects must be controlled by scientific requirements, and that it is no longer true that "any old palace" will do for a museum. It is refreshing to have the opinion of so good authority as Dr. A. B. Meyer in confirmation of my criticism of the Kensington Natural History Museum building. He says[2] in speaking of the grand entrance hall. "The interior is impractical and disagreeable. Even the officials have positively expressed themselves concerning both of these defects, and are certainly the best judges of the first one. The very high entrance hall appears to me to be too churchlike and empty. That it looks very dingy is, of course, due first of all to the London atmosphere, but perhaps also it is due to the character of the building materials and the

[1] Even labeling can be overdone, witness the following:—"The chief features of the museum are the initiation of large sectional labels and a few general labels to species, in addition to the individual labels—all interpreting the truths of science in simple words for the tourists who visit the park. The cases and labels have been painted to harmonize with the natural finish of the building, and the letters on the labels have been made in the color of the knots and grain of the wood." *Science*, Oct. 17, 1913, p. 543.

[2] I quote from the good translation of Dr. Meyer's "Über einige Europaische Museen und verwandte Institute," published by the Smithsonian Institution.

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yellow color, being of terra cotta, ornamented with animal representations in high relief. The side galleries with skylights give somewhat the impression of factory rooms...... The cases are of mahogany, clumsy and unprepossessing; some of the backgrounds are green. The labels have been prepared with much care and taste. The arrangements for lighting are in part deficient." Dr. Meyer continues in relation to the ethnographic collection: "It contains many valuable old specimens, but has not kept pace with its sister collections. While Berlin has, since the seventies, built up an ethnographical collection which is scarcely to be surpassed, and good collections have been brought together in many cities of Europe and America, London has made little progress in the latter half of the last century."

This was written some years ago, and the condition of the London collection has certainly changed since the visit of Dr. Meyer, but the architectural difficulties remain.

Let it not be supposed for a moment that I criticise the architectural defects in a carping or unfriendly way, especially in the case in hand, for Dresden, Munich, Leiden and many other cities have the same architectural difficulties, and it is perhaps by calling attention to these that the new museums, or the old museums contemplating new buildings, will be helped in securing the best possible buildings. Then, too, the British Museum has done so much for us all, in spite of its domiciliary defects, that it is true praise to consider the obstacles in the way. The catalogues of birds, fishes, corals, among the hundreds of volumes to which these museum publications have attained, to mention only those that are necessarily in every working museum library, show that the vast collections at South Kensington are not simply to please the eye or awaken the astonishment of chance visitors, but are being made useful to all the world of scientific students.

This must be the work of a great museum where the most complete series of specimens have for years been collected with the greatest care from all parts of the world. May the time be hastened when the great nations will have their eyes opened to the terrible folly of "dreadnaughts" and other vast expenditures for war, and turn for a while at least to the arts of peace! Let the great museums have sufficient funds to handle their collections; the cost of

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a single great war vessel would put any of the national museums in working order. London, Berlin, Vienna, Paris, Washington, New York, have this cataloguing work laid upon their shoulders, and so far as biology is concerned are perhaps doing all that can be expected, although the great advance in the modern methods of illustration will, if not at once, certainly at no distant day add a new value to these catalogues.

In ethnology the case seems somewhat different. England is not doing what her great wealth, vastly extended dominion over so many and varied races, would seem to be her share in the general accumulation of material, if not her actual duty. Germany has gone beyond England not merely in the number of local museums, often possessors of large and choice collections from all over the world, but also in the central museum in Berlin, which, when its present temporary difficulties are relieved by a more convenient and extensive habitation, may well lead the world in its ethnological catalogues. Lists not merely of dry names but fully illustrated *catalogues raisonnés*, which will describe implements and products as fully as the British Museum catalogues describe, for example, the birds and their eggs. Russia has done and is doing more than England to collect and study information of the heterogeneous tribes and peoples of her great territory.[1] England has left to private students and observers the study of her Australasian peoples, perhaps because her great museum has not got so good a collection of Australian, Maori and Papuan specimens as have several of the local museums in these colonies. Of India she has a better representation, but even there we look rather to the work of private students than to the publications of the great central museum.

For a moment let me turn to local museums such as our own, which is typical of the class to which I have reference. The Bernice Pauahi Bishop Museum is of private endowment, wholly free from Government assistance or control; it is not a purely educational institution like the Horniman Museum in London; it is not for the

[1] It should be noted that the Russian Imperial Academy of Sciences has perhaps more branches and museums than any other similar academy: of museums alone there are The Asiatic, Numismatic, Ethnographic-Anthropologic of Peter the Great, Geological, Botanical, and Zoological. Besides these the Central Physical Observatory with which are connected the observatories at Irkutsk, Ekaterinburg, Pawlowsk and Tiflis.

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instruction of adult visitors in general exhibits gathered from many parts of the world and claiming tribute from the plastic and pictorial arts of civilized as well as of uncivilized peoples, like the Canterbury Museum at Christchurch, New Zealand, for example, out of many others where the separation cannot be economically made into museums of art, of ethnology, of natural history; it is established "as a scientific institution for collecting, preserving, storing and exhibiting specimens of Polynesian and Kindred Antiquities, Ethnology and Natural History, and books treating of, and pictures illustrating the same, and for the examination, investigation, treatment and study of said specimens, and the publication of pictures thereof, and of the results of such investigation and study."[1]

Peculiarly situated on an island surrounded by other islands in an ocean of vast extent, but inhabited by two or three races who have by migrations accidental or intentional become more or less mixed, and whose life-histories, so far as known, are much alike, its work has been to study these peoples more or less allied to its own Hawaiian race. To *study* means much more than merely the collection, preservation and exhibition of the history and products of a now unfortunately vanishing people. We have done the first so far as the Hawaiian group is concerned, until our collection of implements and products surpasses all others: as do our collections of native birds, fishes, land-shells, corals and plants. Of Hawaiian insects the British Museum has a more extensive collection than ours at present. Nor have we confined our labors to the Hawaiian group; all Polynesia and indeed all the Pacific indigenes are necessarily comprised within our horizon so closely are their blood, religion and methods intermixed and interdependent. Next to the Bishop Museum the British Museum has the most complete collection of Hawaiian ethnological material, and third comes Berlin, with Copenhagen and Sydney following at a distance, and beyond these are no Hawaiian museum collections of importance. We should be glad to make our collections of the rest of the Pacific groups as complete as that of Hawaii, but while this can never be we are still striving. For the intelli-

[1] Deed of Trust establishing the Bernice Pauahi Bishop Museum, 1896.

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gent exhibition of our treasures we have provided halls which in convenience and elegance yield to none. Our extensive publications will perhaps show that we are *studying* our collections. Let this then be a brief sketch of a typical local museum of ethnology and natural history.

Now how does such a *local* museum fit into the great work of scientific ethnology and biology? No one knows better than those who have worked in a local museum how constantly it is dependent on the general collections of the great museums. We try to track our Hawaiians back to their origin, and we must depend largely on the great collections to show us what analogous implements or methods are brought together from the regions from whence their ancestors may have entered the Pacific. We cannot *collect* all these for ourselves, both means and space are wanting; we must depend for information upon our colleagues, and in exchange for this we are trying to do with our collections what may make them useful to others. In proof of this I may point to the list of our publications. Local museums seldom have sufficient funds to send out expeditions for ethnological collecting, but they have advantages over most expeditions of limited time in the possibilities a local staff may have in the midst of, and to a certain extent as a part of the people they are investigating; they are more likely to have the language, way of thinking, and, more important still, the confidence of their subjects.

It seems then that besides publishing such matter as is in their power, local museums should place such duplicates as may be spared, in the great collections, as they are wanted: this museum has done so in the case of the British Museum.

The more extensive a special collection is, provided that its specimens are authentic, the better results are likely to follow its study; and the more general the nature of collections in one place and under one administration, of course the better they are for comparative study. Now the condition of ethnological collections even in the museums of Europe is rather chaotic; in America such collections are almost negligible quantities so far as Polynesian specimens are concerned, and indeed we have not in America any strictly *ethnological* museum of general character like the Museum

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für Völkerkunde in Berlin. No other museum at present existing could do the orderly ethnological work of this if its physical condition were unfettered.

Some of the smaller museums have Pacific region collections that are quite suitable for study. Cambridge (England) has a Fijian collection unrivalled in Fiji itself, and we are all waiting for Baron von Hügel to give us, as only he can, the rich stores of his observations upon his collections. We cannot all make the pilgrimage to the Cambridge Museum, but we all could read with pleasure his printed account of the remarkable work of the old Fijian cannibals. Other museums have choice collections of limited range but none can compare with Cambridge in Vitian matters.

The general museums can, when their collections are sufficiently large, adopt the comparative arrangement as does the Oxford Museum.[1] It is certainly vastly instructive to compare almost at a glance, for example, the different methods used by primitive people for making fire; the various bows—and the adaptation of the bow, originally designed for dealing destruction, to the sometimes equally disagreeable action of noise-making. In the National Museum at Washington this method has been worked out admirably in certain lines by Mr. W. Hough, as in the various appliances for artificial light, from the fagot to the gas-mantle and the electric light. Prof. H. Balfour's study of the musical bow has extended to all known lands and tribes, and all ethnologists owe him a debt of gratitude for such an illuminating work. Again, in the Kensington Museum are displayed very comprehensive studies of animal evolution, variation, whether mimetic or economic, or defensive merely. In the Colombo and Buitenzorg Museums the remarkable mimicry of some of the leaf-insects was shown from living specimens. It certainly is not necessary for all museums to be alike except in the desire to advance.

Of the educational work of museums I have spoken in the course of this report, especially in connection with the Oxford, Horniman and Raffles Museum, but the experience of the whole journey convinces me that a large and scientifically arranged museum is not the most suitable place for the instruction of young

[1] See page 34.

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people; it is not a proper place to *attempt* the instruction of young children; the material is too abundant and overwhelming; it is putting a fifty-horsepower engine to do the work of a small kitchen pump; it is both unsuitable and also wasted energy. That others have the same opinion is shown by the number (would it were greater!) of school museums now appearing in many parts of the United States.) While the town museum so common in England is very desirable and fits with more or less success into the life of the town, the school museum scientifically arranged to illustrate and supplement the regular instruction of the school is far more important; and I have one in mind of which (although I have never visited it) I have very full illustration, even to the labeling. I feel that such a museum as this in the very school building (but not, I understand, excluding other visitors), easily accessible to teacher and class, is of the utmost advantage and importance. Nothing approaching its good arrangement and practical utility (except perhaps in the Raffles Museum in Singapore) was seen outside the United States. I refer to the Public School Museum at Battle Creek, Michigan, of which my friend Mr. Edward M. Brigham is Curator. I wish I had the room here to describe fully the good methods and results of this model school museum.

A matter I am sorry to touch upon but which seems necessary from what I have seen and heard, is the increasing prevalence of forgeries in almost every department of ethnology. We have on these islands long known and had bitter experience with the counterfeit Hawaiian stone idols so commonly made by the Portuguese and Japanese workmen, and it has long been known that the jade *heitiki*, so characteristic an ornament of the Maori women, are made in Hamburg, Germany, and also in Auckland, and I have reason to believe that with "poetic justice", some of these purchased in New Zealand from the haka dancers at a high price, have found their way to German museums. There is, however, hardly any form of Polynesian implement commanding a high price (the delicately carved Maori flute, for example) that has not been counterfeited, and often so well done as to "deceive even the elect"; so that I am forced to the belief that there are few, if any, museums free from the presence of these intruders in their collections, and

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I do not know a remedy that is satisfactory. The compilation of a work on what is known of the implements of the Pacific Islands would be a help; and so far as wooden implements go the publication of microscopic sections of authentic specimens of all woods in common use on these islands would be a check: but some woods commonly used, as *Casuarina*, *Calophyllum*, *Aleurites*, are found all through the tropical regions, so the protection would not be complete, and the list of authentic specimens from all the groups would help more as indicating the rarity of such specimens. On the other hand the rarity would be an additional incentive to the devilish ingenuity of the forger. Perhaps personal skill and familiarity with the native work will remain the best security against imposition, and photographic illustrations of genuine specimens as proposed in the projected work mentioned below must do the rest. In the meantime all museum curators must be on their guard against collections made by inexperienced persons, or offered for sale by unknown parties.

I am coming presently to the financial element of museum work; we all feel how important that is, and I confess I have never found a good museum that had half enough money to meet the wants of its staff. I have often noticed in my many journeys that an Englishman was pretty sure, if he found a rare specimen, to think first of the British Museum, and while I frankly confess that I have now and again shifted the points and run the specimen into our own museum, it was pleasant to know that there was a loyal feeling toward the great museum of their home. I suppose the graduates of the great English universities who wander to the uttermost parts of the earth, remember the museum of their Alma Mater; if they do not they have failed to fully profit by their sojourn on the banks of the Isis or the Cam.

In some of the American museums I have found a method of contributing to the good work which seems pleasant. In one a company of persons interested in bird life, although not perhaps scientific students, combine and raise a fund of which the income is to be devoted to the better mounting of bird groups, and presently that museum is able to employ an artist who transfigures the solitary and stiff specimens on perch or stand, into a beautiful home

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group full of life and instruction. Now we all know that these groups are expensive, and there are some trustees of museums, even if the number be small, who have never seen flamingos associated with their nests and breeding surroundings as in the admirable group in the American Museum, or cranes wading in the marshes as in the group just added to the Field Museum in Chicago, or breeding on a "Bird Island" as in the Laysan Island group in the Bishop Museum; and these hard business men reckon the cost, without perhaps balancing the instruction, or, if you choose, merely pleasure. They are right, for there are many departments calling for "food" and they must make their limited funds cover as much of the slice as possible even if the butter is very thin! Now this outside help comes in and saves their consciences. In another case a special fund is raised for *exploring*, another expensive thing beyond the means of a small museum. And there are many other ways in which people of means can do a good work: a case in point comes to mind—the beautiful glass models of flowers and fruits in the Agassiz Museum of Comparative Zoology in Cambridge, Mass. In our own museum visitors are sometimes pleased and ask what they can do to help on the good work, and it is well to be ready with suggestions suited to both person and query. I have found these very productive.

Most museums publish in their annual report a financial statement which is often of use as well as interest to other museums, although the methods of accounting are various. For instance one museum reports:—

Salaries	$96,939.42
Guard service	13,283.23
Janitor service	7,377.14
Heat and light wages	4,009.66

while the smaller museums seldom make the distinction between salary and wage. One has a section of printing and photography, and classes engraving under general expenses, while the next puts photography, engraving as well as binding with the printing account. These are minor matters and it is generally possible to get such results as one is looking for. In a large city the library expenses bear a much smaller proportion to other expenditures than they must in a museum situated far from any reference

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libraries. Then the income from paid admissions: our own museum is free even to the care of articles that must be left in the door-keeper's custody; but most of those demanding a fee have free days, usually Saturday and Sunday, and it is interesting to see the difference. One American museum had:—

PAID ATTENDANCE.

Adults	20,599
Children	2,289
	22,888
Free admission on pay days	11,386
Admission on free days	180,239
Total attendance for a year	214,513

An English museum of much smaller extent which was open also 364 days in the year, but all days free, shows an attendance of 167,502, or an average of 460 *per diem*.

The financial arrangements of museums vary, but with all the larger and more important institutions it is customary to have a budget or its equivalent, which is submitted by the Director in conference with his staff, and if this is approved by the governing board, it relieves this board from farther trouble about the regular expenditures. Its members are not expected to interfere with the scientific administration of the institution unless the machine should get out of running order. On the other hand, the staff is not expected to meddle with the care of the funds, their investment, etc., for which they do not pretend to be especially trained, as is usually the case with trustees, commissioners, regents or whatever may be the style of the governing board. In the large European Government museums this system puts more labor on the Director, for it rests with him to convince the commissioners that the expenditures called for are just and actually needed; if the funds available are not sufficient a limit is given, and the Director must apportion the money appropriated as seems to him best with the advice of his staff. Whatever the system adopted it is desirable that each museum publish its financial statement with its annual report.

The relation of public museums to private collections. I have already remarked on the value of private collections made by educated men who are not mere "curio hunters". All such collections

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contain much that science needs, but in general private collectors do not publish much: often they do not keep in touch with those who are pursuing the same ends in connection with public museums; still less do these workers in a museum know all the good things hidden in private houses. It would be good for many branches of science if this condition of things could be changed, but especially so for ethnography. How best to do this is for each museum to decide: in our own case, in journeying through our island group every member of the staff is watching for private collections, not necessarily to add to the museum stores, but in trained search for something *new*. When found it is sometimes not to be obtained "in fee simple", but it is so rare to be refused the loan of an object for photograph or cast, that I cannot recall an instance. We have many hundred specimens on loan that either cannot be sold, owing to some legal obstacle (as in settling an estate) or because the article may be in the nature of an heirloom and the owner is loath to part irrevocably with it. In this connection attention may be called to the advantage of having specimens stored in a fireproof building where they will be taken care of.

When we go to other parts of the Pacific the same interest holds. Indeed, everywhere I meet friends who know my profession, and who happen to know some one who has a private collection of specimens in my line, to whom they introduce me, and an inspection of this new collection seldom fails to result in happy discoveries. Now if one of my staff is studying some specialty, I am able to tell him not merely what public museum is best supplied with his needed material, but where in private collections he should look for help. Will not his theme be better worked out for this?

If museums generally would interest themselves with the private collections in their vicinity, and if these private collectors would notify curators when they have things not shown in the museum cases, it would require little labor to formulate a system of notes by which the *knowledge* of the extraneous specimen could be incorporated into the museum, if not a cast or photograph.

The day has been when I have looked askance on casts in ethnological museums, but with the artistic coloration now possible my attitude has changed. I know that Mr. J. W. Thompson, the

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artist of the Bishop Museum, has painted casts of unique specimens of carved wood, stone or bone implements that could not be detected on a museum shelf from the original, even with that original by its side. In biological collections the process is necessary in the case of fruits, and especially of fishes, and it was Mr. Thompson's work on the magnificent collection of Hawaiian fishes in the Bishop Museum that led us to complete a series of stone implements (for example) with casts of members of the series of which we could only borrow the unique specimen. In such a series I would prefer to have an unpainted cast than none, and the plain cast is better than one badly painted, as has been too common in museums.

The wonderfully colored fish of the Hawaiian waters can be well preserved only in this way. No preservative known will prevent the destruction of the tints so peculiar a beauty of the living fish. A snake crowded into a bottle is a poor substitute for the same reptile cast in a life-like attitude and artistically colored. How much easier does an inanimate object, like an idol, a bowl, a club, lend itself to this treatment! We do not hesitate to study the plaster casts of the glorious creations of the Greek sculptor, not merely because there is only one original, but because in many cases the cast is nearer the artist's creation when new, and the stains of time and neglect, and the jointures of the restorer are all eliminated.

The time may come when all important museums will photograph their collections on scale, bearing the museum number, for exchange with other museums in the same line and using the same method. We have at least one museum that has furnished good photographs of all specimens from our Pacific region in their cases. In these days of universal photography it is not difficult to get good pictures of any particular specimen desired, and most museums are very obliging in this matter: only care must be taken that the print is a permanent one if it is to be filed away with its card index.

So many of the records of the past scattered through our museums perforce turn our thoughts to the future. What is to be done when all specimens of the work of primitive races have been gathered into museums? The day when all work of unadulterated Polynesia will cease is quite within sight. Hawaii has thrown away

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her kapa-beaters, and all other relics of her ancient individuality; she stills holds to her national food *poi*, but the implements are no longer made in the olden way, and most of the actual manufacture of the food is by the industrious Chinese or by the machines of the foreigner. Samoa makes but little *siapo* (kapa) and that of poor quality to sell to tourists (often in Honolulu as of Hawaiian make). The Marquesans have long ago given up the native manufactures so characteristic, and like the Hawaiians are fast passing away; the Society Islands, Tonga, and indeed all the south-eastern Pacific march in the same procession; New Zealand alone clings to the poor remnants of her fine ancient work. And the passing of the Primitive Age is by no means confined to Polynesia. The missionary of the gospel or of commerce has penetrated all the islands of the Great Ocean in spite of the cannibalistic proclivities that for a while formed a barrier to their impertinencies, and from Rapanui to the end of Dutch New Guinea all that made the interesting inhabitants a peculiar people is vanishing before the inroads of the white invader if not with the speed of the dew before the sun, yet with a rapidity which is no less than appalling to the ethnologist. Where are the sculptors of the gigantic images of Rapanui; where the builders of the trilithon on Tonga; where the carvers of the Marquesas and their artistic tatuers; where the artistic beaters and ornamenters of kapa and the deft weavers of mats and baskets on Hawaii? I need not describe what a so-called civilization has put in the place of the ancient workers; ethnologists know, or if they do not then are they the happier for their ignorance.

As is well known to the Trustees of this museum, and to many others, the Director of this museum planned some years ago an exploration of the Pacific islands on a large scale, and a statement of this was printed and sent to many scientific men and to prominent universities and societies; owing to an intervention that need not be mentioned here, this plan, so far as the museum was concerned, was withdrawn, but the note of warning then sounded caused not a few of the wiser societies to make portions of the desired exploration in various parts of the Pacific, especially in the western and south-eastern regions, and the results while generally good, all confirm what has been said above, that the harvest has been gathered; only the gleanings remain. [414]

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This is not the place to suggest plans for the best utilization of the collections now in museums or with private collectors, but it might be well if the curators into whose hands these pages may come will consider, with their own collection as a text, how to get from their material the best results for science.

It would be well if a census of all the contents of ethnographic museums could be taken; covering not merely the small but interesting region the writer of this report has endeavored to cover, although unsuccessfully, but the whole world of ethnography. This is perhaps a too ambitious project. The printed lists of all the important collections, to which could be added annually all new acquisitions, would be a useful reference for all workers, but the labor would be greater than the majority of museums could undertake, and it would be wiser to make a more modest beginning. From what I have seen of the principal museums of the world, it would be quite within the range of possibility for every one to make the census of all specimens relating to say Polynesia, in its possession with perhaps photographs of any rare or otherwise remarkable specimens. This museum could well undertake the work of bringing together all these, and also all that is known by the reports of early voyagers, and if this proved a help to ethnography, the method could be extended to other regions from other convenient centres. Such a census would show the strangely unbalanced nature of most of the collections and might result in desirable exchanges. One museum may have forty clubs of one pattern, and a dozen door-posts with hardly anything else from the same group; another may have not one of these clubs or door-posts but much of the other manufactures of the group; will it not be for the advantage of both to exchange?

The work would help in the farther study of the many problems affecting the past history of the islanders, and disclose, perchance, more of the relationship between the two great continents to the East and to the West. With the permission of the Trustees of this museum I shall later issue circulars to all the museums of which I have the address, asking for opinions on the project, and for the needed help in case the majority of museums should approve. The work cannot be done by any one or any dozen museums, it

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must be a consensus and collaboration. We here in the midst of the Pacific will edit and publish the results. Our collections of Hawaiian material are larger than any other, and our collections from other parts of Polynesia are perhaps more representative than those of any museum I have seen (with the exception of certain collections in the museums of New Zealand). Our library has been formed largely in view of some such work, and the author of this report has been for some years collecting material for a "catalogue" of what is known about these Hawaiian Islands (not a history—that has been made by other hands and on other lines), but a reference catalogue, chronologically arranged, of the reports of the doings of the Hawaiian people and their manufactures. If his life is prolonged to finish this, it may come, should it be found useful, to be the first of a series of similar catalogues covering the Pacific region.

This suggested work seems greatly needed, and with the cooperation of some of the most completely furnished museums could be carried out by the Director with perhaps two assistants to collate the material and select from the voyages such data as are needed. Much has been collected towards such a purpose in the present journey, and I cannot doubt that museums would furnish for such purpose complete lists of their possessions from the Pacific region.

The Director deems this one of the most important matters brought to his attention on this journey, and it might show all curators of museums what is to be done when the mines of Pacific islands manufactures are exhausted, as those of Polynesia are essentially at present. It looks a little like settling the estate of a deceased person, but there are those now in being who will probably see the last of the Polynesians as we have seen the last of the Tasmanians and Moriori, and at any rate their native manufactures are mostly moribund.

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Enumeration of the Principal Objects from the Pacific in the Ethnographic Collections.

THE following lists do not pretend to be complete, but are simply notes taken hastily in brief visits; but I have found similar notes, taken fourteen years before, were of great use on the present occasion; they at least show in what groups each museum is well provided:

COPENHAGEN. Nationalmuseet den Ethnografiske Samling, Kjobenhavn. Dr. Sophus Müller, Director.

Hawaiian Islands. Feather cloak 57.5 in. long, red, with yellow border at base and yellow triangles at front edges; feather cape of yellow with dark green crescents in body and red spots on neck and edges (Fig. 46); feather cape of red with yellow ornaments, slightly smaller than the preceding; feather helmet in fair condition, but like the cloak and capes has suffered much from exposure to light; 2 kahili with ivory and tortoise-shell handles 6 ft. long; 2 kupee ilio or dog-tusk anklets, 3 lei niho palaoa, figured kapa pa'u, hula skirt; 6 pieces of kapa, good quality, 3 ordinary; stone mirror .5 in. thick; 3 huewai pawehe, huewai in koko, one in ahu; small umeke, small Triton trumpet, coconut drum for arm, 2 ulumaika, shark-tooth cutter, bailer, string of kukui nuts for candle; 7 stone adzes, one very large, 2 more with handles; 2 common poi-pounders, 1 ring pounder; 6 ie kuku, one very good; 2 pa'u boards, cleaner for these boards; 6 ohe kapalapala, one with *ea* stamp; 3 kupee of whale tooth, another of pipipi shells (*Nerita polita*); idol of rude carving about 3 ft. long and 3 in. diameter (Fig. 45). Many of these specimens were given by Captain Steen Bille.

Marquesas Islands. Three stilt rests, rather poor carving; 3 clubs, good; 2 paddles. Two figures, 12 in. high, united by the back of the head (common Marquesan way), the middle wrapped in white kapa.

Hervey Islands. Seven carved ceremonial paddles; 12 ceremonial adzes, two quite small, Mangaia.

Society Islands. Four wooden bowls, long and pointed like those from New Guinea, longest 40 in., carved on rim; 5 stone adzes, one mounted; large kapa-beater; kapa stamped with fern leaves in red; stone chisel; fine set of tatuing tools, paddle-shaped with rod beater; wooden seat, dish form; wooden gong 43 in. long; 18 kapa-beaters.

Rapanui or Easter Island. Figure carved in wood, 2 wooden clubs with human heads, 7 obsidian lance-heads.

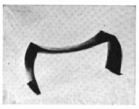
Samoan Islands. Kava bowl 3 ft. diam.; 14 kapa (*siapo*); upete, small; 10 stone adzes, one mounted; white hibiscus fibre mat, red mat; 2 Nautilus shell frontlets, 3 combs, 3 fans, 2 spears, 4 fish-hooks with braided lines; 2 clubs, narrow.

New Zealand. Mokoed head [Et tatoveret Mandshoved], tiki 50 in. high with usual three fingers, 2 carved house slabs, carved covered kumete 26 in. long, 4 mere of bone, 5 of greenstone, 2 of wood, plain, 1 carved wood; 29 greenstone adzes, 12 of jade; 3 trumpets of carved wood 15 in. long, 2 bone flutes, modern tiki of two men one above the other, Taiaha, Tewhatewha; flax-pounder of stone, 2 cloaks of flax (*Phormium tenax*), cape of same; small old kumete, 3 fish-hooks, bone and shell; 2 shark-hooks, canoe model [Krigskano], war-canoe prow, 6 heitiki of jade, 5 jade earrings.

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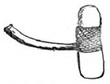
Tongan Islands. Awa bowl 31 in. in diameter, 11 carved clubs, 2 bambu fish-spears; wooden pillow, usual form (Fig. 197); sling, well made.

Fijian Group. Fifteen stone adzes, 3 adzes with handles, 2 yaqona bowls, 6 pots of common form, 2 pottery jars of unusual form, pottery bowl, upete of wood 60 in. long, 12 in. wide; 3 kapa-beaters, 6 pillows, carved, others plain, one 3± ft. long; house model, canoe model, wooden bowl, 15± in. diam., oil dish on stand, cannibal fork, 2 whale tooth necklaces, food-hook, tatuing tools, 2 whale-tooth ornaments, fish-spear, 20 throwing-clubs; 13 clubs, musket form; 6 pineapple clubs, 15 ball and knobbed shape, 8 war-paddles, 5 spears carved, wig of human hair, 5 human figures with cachelot-teeth ornaments, human bone relic of cannibal feast, 4 shell necklaces, one of human teeth; satchel, long.



197. CARVED TONGAN PILLOW.

New Caledonia. Two human figures, one life size; 2 small male wooden images, wooden baby in box, complete death-mask, portion



198. GREENSTONE CLUB.



199. SHORT HANDLE ADZE.

of another; 2 sling-pouches, sling, 20 slingstones; greenstone and wood club (Fig. 198), 3 bird-bill clubs, 15 knob clubs, some phallic; jade disk club, 4 adzes with short handles (Fig. 199), carved demon 24 inches high.

New Hebrides. Two boar-tusk figures, 6 spindle clubs, 7 knobbed clubs, necklace.

New Ireland. Twenty human figures in chalk, mostly male.

New Britain. Seven masks, 3 slings, 4 paddles and numerous carved human figures.

New Guinea. Two ball stone clubs, 3 carved spirit houses, 4 drums, 6 pillow rests, carved paddles, adzes.

Solomon Islands. Bows and arrows galore, carved figure, 2 human figures in wood, arm coil, plaited shield, good; 4 longiels, 2 paddles; spears many, some with cassowary bone tips; 4 clubs, 4 basket-work clubs, 6 dance clubs, 5 combs, 3 fine carved bowls, 3 adzes, Tindalo or ring god, 2 canoe ends decked with *Ovulum* shells, pan-pipe, 3 belts of shell beads, 2 shell disk frontlets with carved tortoise-shell ornaments, 2 plain shell disks.

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Admiralty Islands. Two human figures, 8 spears with obsidian heads; obsidian dagger with well-carved human head for handle, a fine specimen; 2 lime-boxes of gourd, canoe-bailer; penis cover engraved shell of *Ovulum ovum*.

Australia. Shields, throwing-clubs and boomerangs. A good general collection.

Caroline Islands. Very fair collection; nothing rare.

Gilbert Islands. Complete coconut fibre armor and shark-tooth weapons.

HAMBURG. Staatliches Museum für Völkerkunde. Dr. Georg Thilenius, Director.

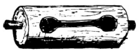
Hawaiian Islands. Two huewai pawehe, 4 adzes in fragments, model of a double canoe.

Hervey Islands. Four ceremonial adzes and 4 paddles, all from Mangaia.

Niue Island. Three paddles, longiel.

Rapanui. Four human figures; bird, well carved; talking-stick or paddle, club, 2 rude stone human heads, 4 obsidian lance-heads, wooden crescent-shaped gorget.

Marquesas Islands. Crown of carved bone, tortoise-shell and feathers; 3 stilt rests, 3 spears, several beards of old men; fan, club.



200. GONG, CAROLINE ISLANDS.

Samoan Islands. Small fishing canoe, white hibiscus fibre mat, 2 hook clubs, 5 spears, 4 serrate clubs, house model; 15 siapo, ordinary patterns; 13 fans, 2 baskets, 2 fly-flaps, 3 shell frontlets, common pillow, tatuing implements.

Tongan Islands. Gypsum poi-pounder, 2 wooden pillows, 3 squid bait.

Manihiki. Paddle inlaid with circles of pearl shell; club, two bowls and a box inlaid in the same way.

Fijian Group. Twenty-four throwing-clubs, 6 pineapple clubs, 7 knobbed clubs, 10 round, 10 musket form; tree stem with human bones imbedded, a cannibal trophy; 3 cannibal dishes, 2 oil dishes, 7 yaqona bowls, 16 pots, roll for marking kapa, 3 kapa-beaters, 3 wooden pillows, long round pillow, 2 flat-topped pillows, 3 human hair wigs, 2 chief's staves, 4 satchels, flat; 14 carved spears, model of devil house in sennit.

New Caledonia. Death-mask in poor condition, 2 adzes with handles, 2 bird-bill clubs, 2 round clubs, small human figure, 3 water-bottles, 2 bambu combs, cylindrical woven head-dress or cape, dresses galore.

Caroline Islands. Six oblong wooden bowls, 2 wooden boxes with covers, canoe model, 2 shark-floats, 7 decorated canoe sticks, 3 decorated house beams (used to hang clothes upon), 3 coral-rock pounders, 7 belts, wooden gong with handles at end (Fig. 200); tols in great number. Nukuor figure in wood 66 in. high, 4 smaller figures from same locality. Ponapean flat kapa-beater, tortoise-shell dishes and spoons, tatuing implements, hat

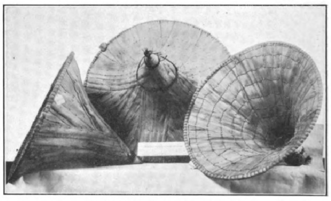
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used in reef-fishing (Fig. 201), sling-stones, common mats, large boat-shaped idol, tortoise-bone hoe, 20 packages of taik, comb with feathers.

Gilbert Islands. Three suits of coconut fibre armor, another suit with an erect collar (Fig. 202), 3 trousers of fibre with shirt attached, sunfish belt, glove armed with shark teeth, 12 shark-teeth swords, cord dresses, models of canoes, mats of hau and pandanus, 3 stalactite fish-hooks, 4 common fish-hooks.

Marshall Islands. Two drums, 3 canoe models, stone adze with an unusual knob on the handle (Fig. 203).



201. CAROLINE ISLANDS HATS WORN ON REEF.

Bismarck Archipelago. Many masks, 11 human frontal bone masks, large chalk figure, 19 smaller ones, 11 stone ball clubs, many swords and flat clubs, 5 carvings from New Britain. Group of Hornbill (*Buceros*) delivering a woman—this bird being the Lucina of New Ireland.

New Guinea. Curved wooden shield, heavy round shield, 5 dukduk hats.

New Hebrides. Human figures and many clubs of ordinary forms.

Admiralty Islands. Nine obsidian lance-heads.

Solomon Islands. Shield finely inlaid with squares of pearl shell, 7 carved canoe figures, canoe model, small food bowl; 7 dance paddles of common form, and 3 with carved handles; 2 clubs covered with plaited *Gleichenia*, shell disk frontlet with tortoise-shell "thunder-bolt".

Hermit or Anachorite Islands. Three long, pointed wooden bowls; 2 shell adzes, 4 frontal bone masks, wooden fiddle (New Britain).

Torres Straits Islands. Tortoise-shell masks, good; 2 disk clubs, 3 carved pillows, star club, 3 drums.

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BERLIN. Museum für Völkerkunde. Prof. Dr. Albert Grünwedel, Director.

Hawaiian Islands. (Largely the collection of Dr. Edward Arning.) Feather cloak 51 in. long, mostly red with yellow crescent ornaments; feather cape 16 in. long in middle, 9 in. on front border, red ground with yellow border, triangles and crescents; cape 14 in. long, yellow ground and red semi-crescents and triangles; helmet with traces of feathers, helmet with yellow crest and traces of red and black feathers; helmet, red with black stripe at the base of crest, which is capped with yellow, two stripes on left side; helmet without feathers, but with a crest of five pedunculated disks; kukailimoku with reddish hair, 2 hula drums of gourd; drum of coconut wood; another with head and more elaborate carving; ukeke, a poor specimen; 3 bambu time-beaters (*Ohe hula puili*); gourd *ipu hokiokio*, another of coconut; 4 rattles of gourd with feathers, one without; 2 nose flutes, coco-



202. GILBERT ISLANDS.



203. ADZE, MARSHALL ISLANDS.

nut drum, 2 stone cups, 12 sling-stones, good; kua oloná, club of rude form with cord attached, stone weapon of double conical form, 2 hala pillows, 5 pair of sandals of various material, hat block of coconut wood, polishing stones, kua kuku for beating kapa, 23 ie kuku or kapa-beaters, 53 ohe kapa-pala or carved stamps for printing kapa, 3 hohoa or round kapa-beaters, 4 bambu ruling pens, 2 koa surf boards about 8 ft. long, 4 paddles without ihu, canoe-god with four heads and shell eyes; 3 squid-hooks complete, one with wooden, two with metal points; 5 hala fish baskets, 2 laau melomelo or bait-sticks, fish-hook of two pieces of bone bound together at the base; 2 of ivory, single barb; 3 of pearl-shell; 7 of tortoise-shell; fishing whip, 2 shrimp traps, netting apparatus complete, wooden shark-hook with bone point, idol of wood with hair carved in form of a wig; image kneeling, the only one from Hawaii in this unusual position;[1] idol, small, unfinished; 2 idols of rough tree stems; image of breadfruit, without arms or legs, the long slim body stuck full of pegs of coconut wood; 4 idols of carved wood, small; 3 rude stone

[1] Figured in *Occasional Papers*, Vol. 1, Pl. VIII.

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idols, idol of lava melted over coral rock, idol of lava rudely carved, large stone *membrum virile;* 2 stone figures formerly at Kahuku, Oahu: one represents a European (Spanish?), and was anciently in Manoa Valley; the other is an ordinary image.[1] Curious wooden figure with white pig bristles arranged like a shoe-brush on the head. Sample of oloná netting for feather-work; 3 wooden dishes for roast pig; fish dish 15 in. long, handles at the ends; umeke, round; one hexagonal, well made; one large, flat; another long, flat. Finger bowl of unusual shape (Fig. 204), 2 ipu aina, 4 spittoons; 7 decorated water-bottles, fine; umeke pawehe; huewai pueo pawehe, small; huewai pueo, small, plain; 5 koko niu of commoners; 6 koko puupuu, mostly of oloná or waoke and niu; 3 auamo or bearing-sticks; ipu hanohano, gourd syringe; ihe pahe 42 in. long; ihe pahe, short and thick, with cord; slender stick mislabelled "ihe pahe"; leiomano with six shark-teeth fastened in with pegs; implement with one shark-tooth fastened with three cords; one with two cords; 5 pandanus fans, 3 kauila wood implements for carving (Fig. 205), 2 pa'u and malo boards; cleaner for pa'u boards, fine but broken at the ends; 22 stone adzes



204. FINGER BOWL.



205. CUTTER.



206. STONE LAMPS.

and 21 fragments of same, 9 koi pahoa of small size, 4 koi pahoa with handles, iron adze with handle; stone chisel, fine; 2 small grindstones, 12 stone lamps (Fig. 206), stone club, stone pestle, 6 long strings of kukui nuts for candles; 8 niho palaoa, one with coarse braid, another with twisted hair and small niho; 3 lei of bone beads, some spiral; kupee niho ilio, lei mokihana, lei of *Abutilon* capsules, 3 of *Coix Lachryma*, 1 of *Abrus precatorius*, 1 of kukui nuts cut polyhedral, 1 of dog's teeth, 1 of red and white *Pecten* valves, 1 of Niihau shells, 1 of these shells and *Erythrina* seeds; 9 bone bosses for armlets, tatuing instruments and stone cup for ink; 4 stone mirrors, some with holes drilled; bone comb; 2 cup and ball, one with kapa, the other with coconut ball; 15 ulumaika, ordinary; 8 ulumaika, rough; 6 rounded stones for cooking; 6 models of grass houses; bow and arrows for mice, newly made; ring poi-pounder; 8 poi-pounders, ordinary form; another of coral rock; *pohaku kui noni*, 2 *laau lomilomi*, 3 holua runners; pololu of usual form; another with barbs; large stone canoe-breaker bound with cord; kauila wedge with cord for canoe building; koa canoe about 15 ft. long, with *wiliwili* outrigger strengthened by wood cleats; 2 teetotums of kukui nut; many specimens of modern straw braid; awa root; kapas of common kinds.

Samoan Islands. Seven canoe models; 2 gongs of wood, trough form, 60 in. long, 61 in. girth; 2 grindstones, fans galore; awa bowl of peculiar form (Fig. 207); 7 small awa bowls, 3 combs, 5 kapa-beaters, 3 upete for printing siapo, 6 stone adzes with handles, 55 without; 26 war clubs of various but

[1] By the kindness of Dr. Bastian the Museum has fine casts of both these figures. *Loc. cit.*, Pls. IX, X.

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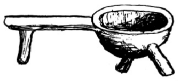
not unusual forms, 2 throwing-clubs, 4 carved spears, 2 shell bands, 7 coconut cups for awa; 3 pandanus mats, fine texture; several coarser; 2 ali or bambu pillows, 2 bed mats of white hibiscus fibre, upete of wood; round basket, good workmanship; mat for the game of *lafoga*.

Tongan Islands. Eighteen combs of usual form, pillow of wood, 2 pan-pipes, belt of human hair; 5 stone adzes and another mounted; 2 baskets of dark material, one long, the other round; upete for printing kapa, 2 spears barbed, club carved, 4 plain clubs.

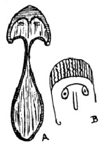
Society Islands. Six fish-hooks of wood and bone, 2 of bone with tortoise-shell barb and back, 2 poi-pounders; 3 stone adzes mounted, 4 without handles; adzes of shell mounted, 2 gorgets, ornament of pearl-shell plates; drum 7 in. in diameter, tall with braids of sennit to tighten head; 2 drums of wood similar in form to the Hawaiian; bailer, fan.

Marquesas Islands. Four finely carved clubs, 2 stilt rests, 2 Triton shell trumpets, pearl-shell with tortoise-shell ornament.

Hervey Islands. Three paddles carved, rosette handles; 3 with square flat handles, all from Mangaia.



207. AWA BOWL.



208. RAPANUI.

Paumotu Islands. Two canoe models, double, inlaid with pearl-shell, Manihiki. Curious wooden pillow. Kapa-beater 2 in. square, 2 ft. long; another 3 in. square, 15 in. long.

Rapanui or Easter Island. Three human figures, one remarkably fine; 9 images of inferior quality, 4 lizards, 2 moi; 2 "talking-sticks" of ordinary form and size; another very old, showing the human head (Fig. 208, A-B); stone head, 6 head-rings of feathers; 7 obsidian lance-heads, another mounted on a long staff; 3 large stone adzes, 3 curiously carved paddles with groove at small end for attaching the awkward handle, 2 crescent-shaped gorgets.

New Zealand. Two mokoed human heads, canoe prow of ancient form; stern-post of canoe, very narrow. Modeled figure with cloak of flax, heitiki, staff and mere; 3 pare or door-caps, large and fairly carved; 2 carved feather boxes, side-post of door; 4 tikis, one a female with lizard. Carved funnel for feeding a chief while undergoing moko. Portion of carved canoe prow, grindstone, 2 jade heitikis, jade earrings, 2 hammer stones, 33 greenstone adzes, 9 jade adzes, 2 greenstone meres; 3 jade meres; 2 meres of wood, plain; 7 carved. Mere of carved bone, 6 of plain bone; 2 clubs, carved; 2 flax-pounders of stone, 4 carved wood walking-sticks; tata of medium size, model of canoe; 3 paddles, plain; 3 carved; 12 taiaha or chief's staff, 9 tewhatewha or battle-axes.

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Fiji. Twenty-seven common pieces of pottery; 21 clubs, musket form, 3 decorated with shells; 18 throwing, 10 round, 14 knobbed, 6 pineapple, one very small head; 11 spears, finely carved; 2 war paddles; paddle with shovel blade, 4 others carved; 2 carved lances, short and barbed; 3 kapa-beaters, one handle carved; 3 wooden shark-hooks. Head covering of netted rushes tipped with feathers; 5 ornaments of whale-teeth; two more with the teeth halved. 4 necklaces of cachelot teeth; 3 with filed teeth. Many fringed dresses, 4 yaqona bowls, oval yaqona bowl on four legs; 5 fans, mostly of whole palm leaves. Oil dish with carved support; another semicircular, 3 cannibal forks, carved wooden spoon, turtle-bone scoop, 2 food-hooks of odd forms, many kapa sulas. Human figure 30 in. high, carved wood, round face; 4 wooden pillows.

Micronesia. Chisels of shell, daggers of bambu, stool of wood inlaid with bone. Helmet of coconut braid conical in form, 15 in. high; 3 round, carved wood boxes; 6 carved wood figures. Fire-plow, quite like the Hawaiian; 2 rasps of wood covered with sunfish skin. House model from Kusaie (Finsch, 1883); shell tripod dish. Bundles of preserved food and many of the common shell ornaments, belts, earrings, etc.



209. SHELL ADZE, HERMIT ISLANDS.

Hermit Islands. Two wooden food troughs, one 8.5 ft., the other 6± ft. long, with well-carved internal handles. Large flat dish of dark wood, 2 bailers with handle attached to the bottom; 6 carved canoe prows, one quite large; 15 human lower jaw ornaments, 4 canoe models, 12 wood pins beautifully carved, 2 carved wood fishes; 2 wooden dishes with handles and obtuse ends; 6 similar ones, but with carved, pointed ends. Four wooden bowls, two of them small and like those from the Admiralty Islands. Five shell adzes (Fig. 209), 2 wooden ladles with human figures, carved adze handle; kapa, coarse and slightly beaten; 7 combs, three of them with bearded human heads. Fish-hooks of single piece of shell, decorated, but of rough finish and without barbs.

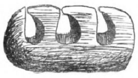
Admiralty Islands. Forty-five obsidian-head lances; 10 gourd, decorated lime-boxes, hour-glass shape; 3 wooden bowls carved in form of birds; 2 smaller ones of same form but lighter wood. Globular bowls of red pottery; wooden bowl on four legs, a smaller one with carved handles; 3 bailers, the ends of handles phallic. Cylindrical wood gong 3 ft. long, slit lengthwise and hollow, projecting handles at the ends, carved decorations over the handles; 4 oval wooden bowls, 2 similar with finely carved handles; bead belt with 14 strands; canoe model, outriggered; 5 lances, carved; 8 obsidian daggers; 8 daggers, carved, sting-ray points; adze of obsidian, large wooden food bowl, 5 ladles with carved handles; 3 obsidian axes, one with carved handle.

New Hebrides. Two large human figures of rushes with skulls or frontal bones, painted; 6 knobbed (star) clubs of dark wood; 4 spears with single point and carved head; 14 with many barbs, carved; 3 with many points of sting-ray; 13 bows; 6 clubs, spindle pattern; arrows with bluish points, net pig-catcher, 3 pan-pipes with 6, 7, and 17 reeds; carved oval wooden bowl

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20 in. long; 2 long basket-work cones with seed capsule rattles at the apex. Small rush figure with extended arms and fingers; 2 decorated caps for festivals; 4 earthern pots, two of them from Santo.

Solomon Islands. Nine clubs covered with fern-stem braid; 11 paddle clubs of dark wood, 15 of light wood; 5 longiels, 4 dance longiels, 5 arm-guards of coiled vine, 35 stone axes; 2 shields of wood, 2 of reeds, and 1 braided, plain; 12 carved canoe figures, 20 carved dance figures; 18 dance paddles, common; 12 with carved tops; pump-drill with cylindrical fly, 2 war belts; arrows galore. Canoe model inlaid, 2 women's dresses of white cord, 2 carved boat idols with turban-like head covers, club of flat rhomboidal form, 2 masks inlaid, 4 earthern pots, 18 bows, 7 canoe heads inlaid with pearl-shell. Food bowl, inlaid, family size; another smaller. Human figure on frame, 2 human heads carved on a base, double-headed human figure, inlaid; braided comb, 3 large wooden mortars from Shortland Island, the largest 30 in. high exclusive of ground peg; 3 bunches of white *Helix* shells used as rattles, 7 decorated coconut and bambu water-bottles, 9 woven baskets or bags, 18 stone adzes; 9 baskets of rattan, 2 with handles; 8 hair-pins with human figure carved on top, 13 lime-boxes of bambu decorated; 19 lime-boxes of gourd, engraved; large pan-pipe, with 12 reeds. More than 50 red and yellow woven armlets of artistic patterns.



210. WOODEN FIDDLE.

New Guinea and Bismarck Archipelago. An immense collection impossible to enumerate here. It is probably the best in any museum, as one would expect from the extensive interests of the German Government in this region. Of the more remarkable objects are the following: Eleven shields, heavy, carved wood; 10 shields, similar but rectangular; 8 decorated shields of wood curved horizontally; 14 similar but curved vertically; 2 wooden shields from Friedrich Wilhelm's Land, 7 carved wood shields with arm notch at top, 3 hour-glass shields covered with braided rattan, 10 stone disk clubs, stone star club, club with triangular stone head, 6 knobbed clubs, 2 pump-drills, 6 carved wood pillows, 11 stone adzes mounted; 14 drums with lizard-skin heads and flat bases; 2 similar with mitre-shaped bases; 2 pan-pipes with 24 reeds, from New Hanover; 2 similar pipes from the same locality with 20 and 21 reeds. From New Ireland: 12 masks of human frontal bones, 25 stone ball clubs; war-gong, a hollow cylinder 49 in. long and 69 in circumference, with a longitudinal slit 2 in. wide; 27 chisel-like adzes of greenstone; 21 chalk images, some of unusual size; 2 wood floats for shark fishing. Wooden fiddle from New Britain (Fig. 210), 6 shell collars flat on the fibre, same locality. Two mummies of children from Torres Strait; 7 tortoise-shell masks from same locality. Triton trumpet, dukduk costume, 7 matrimonial nut signals; 8 wooden clubs, cone at both ends, 26 small greenstone adzes, bags decorated with *Coix* seeds; slings like Hawaiian from Kaiser Wilhelm Land. Pan-pipes with 9 reeds, lower ends fibre-bound; lime-boxes of gourd and coconut shell, shell crescents, etc.

LEIDEN. Rijks Ethnographisch Museum te Leiden. Dr. H. H. Juynboll, Directeur.

Hawaiian Islands. Feather cloak, red with yellow triangles.[1] Feather cape with a narrow border of red and yellow feathers alternating triangles on sides and neck, the body covered with the green-black feathers of the Frigate-

[1] This has been figured in the *Internationales Archiv für Ethnographie*, Bd. I. Taf. viii. At present this is much torn and faded.

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211. CARVED DISH IN THE LEIDEN MUSEUM.

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bird, also figured *loc. cit.*, Taf. vii. Oval dish of carved wood with two kneeling figures as supports; the head of one of the figures is hollowed as for salt, and both have shell inlaid eyes (Fig. 211); 2 swords of kauila wood set with shark-teeth, huewai pawehe, netting needle, several fish-hooks.

Samoan Islands. Several good clubs, 2 white hibiscus fibre mats, 3 kapa-beaters, 2 upete, arca shell for cleaning bark; baskets, fans, kapa of common designs.

Marquesas Islands. Six stilt rests of fine quality; 2 stilt rests with double figures attached back to back, unique. Several fine clubs, one of large size; many earrings of human bone. Several paddles, one with twist at the end.

Hervey Islands. Two carved paddles more than six feet long, 2 common size; ceremonial adzes.

Tongan Islands. Three fine clubs, one especially well carved; carved rest.

Tahiti, Society Islands. Mourning costume; fern-stamped kapa.

Fiji. Forty clubs of common forms, several fine pineapple pattern, and a few good lotus clubs. Club inlaid with 5 human molar teeth; 12 carved spears, several wooden images, lali or gong of good size and finish, 3 cannibal forks, 3 wigs, 6 especially good bowls, 2 kapa-beaters, models of houses, tatuing instruments, ornamental paddle; pillow, duplicate of one in Mr. Beasley's collection.

New Zealand. Mokoed head, canoe model, tiki with engraved pearl-shell eyes, 2 meres of greenstone; 3 kumete, carved, common form; 1 well carved with male and female figures. *Loc. cit.*, Taf. viii, 4. Two taiaha, 2 patu of carved wood, 2 stone adzes with handles, 2 tewhatewha without feathers. Bailer figured in the Archiv. Bd. I, Taf. vii. Kauri gum head, two-thirds life size.

Solomon Islands. Small carved and inlaid food bowl; 2 clubs, covered with braided fern; shield inlaid with pearl-shell squares but much dilapidated.

New Caledonia. Two death-masks, good; 4 disk clubs, 8 bird-bill clubs, few knob clubs.

New Guinea. Fine human figure; 2 shields, hour-glass form; 2 shields of heavy wood, round; another carved. Many elaborately carved *korowaars*; pillows, drums, in short a collection from Dutch New Guinea too large to catalogue in the short time at our disposal.

New Hebrides. Fine large figure.

New Ireland. Very large drum, 7 masks of human frontal bones, 12 chalk figures, many carved figures and masks.

Admiralty Islands. Four obsidian lance-heads, wooden dish or box. Fair collection of Matty Island bowls.

New Britain. Two wooden fiddles of the form peculiar to this group,

Hervey Islands. Ten carved ceremonial adzes; 3 carved paddles, 2 common ones.

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AMSTERDAM. Koninklijk Zoologisch Genootschap "Natura Artis Magistra". Prof. Dr. J. C. H. de Meyere, Conservator of the Ethnographic Museum.

Hawaiian Islands. Huewai pawehe, lei palaoa, feather lei, bone fish-hook (Fig. 212).

Marquesas Islands. Pair of stilt rests and a fine club.



212. BONE FISH-HOOK.

New Zealand. Greenstone mere and adze with handle, 2 jade heitiki, human face from old carving.

Fiji. Human figure in wood, 17 carved spears; 5 clubs, musket form; 5 knobbed, 2 pineapple, 2 round, 5 throwing.

New Caledonia. Several clubs, bird-bill and common.

New Ireland. Three carved figures; club and worship-sticks.

Hervey Islands. Five ceremonial adzes and a carved paddle.

New Guinea and Bismarck Archipelago. Carved paddles, fine shields, 10 korowaar and many bags. A few objects from the Solomon and Admiralty Islands.

ST. PETERSBURG. Academy of Sciences. Peter the Great Museum. Dr. W. Radloff, Curator.

Hawaiian Collection from Cook Expedition. Pair boar-tusk anklets, kupee niho; 3 fans, ancient form; feather cloak, 5 feather capes; 3 feather helmets, one of black feathers, the only one seen; lei niho palaoa, 2 fine shark-hooks, 3 ulumaika; 25 pieces of kapa, mostly figured; shark-teeth knife, ukeke, 2 squid-hooks, 2 combs, ipu hokiokio, 6 fish-hooks, 2 ipuwai, koko, feather lei, 2 wooden figures, 2 stone figures, 2 fish-nets, 2 gourds.

Samoan Islands. Four pillows, 6 awa bowls; 25 clubs, large and small; 2 "tooth-of-death" clubs, 15 fans, 6 baskets, cachelot necklace, 4 miscellaneous necklaces; selection of good siapo; kapa-beater with rounded knob handle.

New Zealand. Two house carvings; tiki for peak; 3 mokoed heads (2 *post mortem*, 1 original); 5 taiaha, 3 tewhatewha, 3 paddles, 3 heitiki, 6 feather-boxes, 3 greenstone mere, 3 fish-hooks, 6 adzes, patu, 12 flax capes, 4 satchels; 2 large hooks, metal and wood; grotesque carving; carved adze handle, 3 clubs, number of small jade ornaments.

Marquesas Islands. Pair of mounted ancient stilts, complete, 7 ft. high; 2 stilt rests, 2 mounted adzes, club, fine paddle, earrings.

Rapanui or Easter Island. Five Easter Island figures.

Mangaia, Hervey Islands. Many ceremonial adzes large and small, 12 carved paddles, 4 plain paddles.

Tongan Islands. Twenty-five fine clubs, horizontal drum, vertical drum, 4 combs, 2 pillows, 2 bowls, baskets, specimens of kapa.

Fiji. Yaqona bowl, spears, 5 whale-tooth ornaments, 3 specimens of pottery, pillow, 6 paddles, 11 musket clubs, 2 pineapple clubs, 4 knobbed clubs, 4 throwing-clubs, carved club.

Admiralty Islands and Matty Island. Eight obsidian daggers, 5 adzes, bowl, 2 figures, spears, 6 dishes and 4 adzes from Matty Island.

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New Ireland. Six masks, 2 chalk figures, 2 temple figures and many wooden figures.

New Hebrides. Dancing-wand, figures and mask, 3 bows.

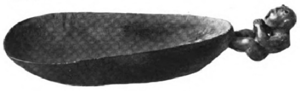
New Caledonia. Three bird-bill, clubs, mushroom club, 9 spears, 3 fish-hooks, water-bottle bound with sennit.

New Britain. Flute and spears.

Solomon Islands. Sixteen arm-guards, 7 bows and arrows, spears, 2 wristlets, 2 combs, 4 bowls, 6 baskets, water-bottle (coconut and bambu), 2 wooden figures.

Marshall Islands. Represented by small collection.

New Guinea. Good and large collection, but could not conveniently be catalogued.



213. LADLE, VIENNA.

BUDAPEST. Magyar Nemzeti Muzeum. (Hungarian National Museum.) v. Szalay Imre, Director.

New Guinea. Ladder 6 ft. long, 9 pillows, 8 carved ladles, 10 carved scoops, 8 idols, 11 heads, 10 drums, drum 6 ft. long, 6 masks, 6 flutes, 4 trumpets, 5 pipe whistles, 10 fine adzes, 6 shields, many paddles, 6 spears, tapa specimens, many ornaments.

Solomon Islands. Inlaid wooden cooking bowl, 3 bowls, 6 paddles, 7 shields, 12 fine combs, 5 baskets, phallic club, 10 carved clubs, drum of coconut wood, 30 spears, 5 fish-spears.

Fiji. Pillows, adzes, clubs and specimens of kapa.

Admiralty Islands. Eight large bowls.

Matty Island. Images, adzes, dishes, bowls, bailers.

New Hebrides. Three clubs.

New Ireland. Head-dress and masks, 6 house ornaments.

Samoan Islands. Bowls for awa, siapo specimens.

VIENNA. Kaiserlich-königlich naturhistorische Hofmuseum, Ethnological section. Dr. Franz Heger, Director.

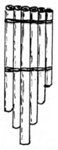
Hawaiian Islands. Feather god, *Kukailimoku*, red with yellow trimmings, dog-teeth and shell eyes; 3 feather helmets (figured in *Memoirs*, I. p. 42). Feather model of a temple oracle (*ibid.* p. 30). Hat of European

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form once covered with feather-work, but now much dilapidated. I have since seen a similar one from the Cook collection now in the Dominion Museum, Wellington, N. Z., which is in good order and is figured in the list of articles in that museum given below. Feather cape (*ibid.* p. 76), 2 feather capes of the long and narrow form, worn over one shoulder; carved wooden ladle with anthropomorphic handle (Fig. 213); 3 shark-teeth cutters of various forms. Crescent-shaped weapon with 8 teeth fastened in with 2 pegs each, an unusual way (Fig. 214). All the foregoing implements are from Cook. Niho palaoa with small niho and few strands; ipu wai pawehe 12 in. in diameter; umeke of wood, flat form; a deep umeke, and 1 with cover; hula drum 8 in. diameter; boar-tusk armlet, similar one with small teeth; 2 armlets of wood and bone, 1 of dog-teeth, another of strombus shells. Anklet 8 in. square, of dog-tusks; 1 of white shells, another of black and white shells; 5 ulumaika, good; 4 stone mirrors, all but one with holes drilled near the rim; adze of indurated coral, 1 of phonolite, and a second one of the same material with handle; paddle of common form; 2 mat bags, square. Niihau mat of good quality and several other mats.



214. WEAPON, VIENNA.



214A. TONGAN PIPE.

Tongan Islands. Kapa of excellent quality and design (Cook); pan-pipe of unusual form (Fig. 214 A); 3 baskets, 1 very fine; tatuing instruments, kapa-beater (called Samoan).

Society Islands. Four stone poi-pounders, handles differing in each.

Marquesas Islands. Stone idol, pestle of stone; 2 clubs of the flat, carved head pattern found now only in museums.

Hervey Islands. Fine lace mat, perhaps Tongan, as in the Berne collection is a similar one so attributed.

Rapanui or Easter Island. Many figures of ordinary quality, and a small carved octopus. Of the wooden images 4 were lean male, 3 fat male and 6 female. Talking-stick, old with very large head; 8 others with human heads, fine; carved bird of strange form; 2 blocks of wood covered with hieroglyphs, 3 obsidian spear or dagger points; 2 black feather head-bands, 3 of cock's feathers; 2 fish-hooks of bone bound together at the base; wooden penis 6 in. long carved with open meatus and double ends; bone tatuing needles.

Manihiki (Paumotu Archipelago). Paddles of coconut wood inlaid with small pearl-shell disks.

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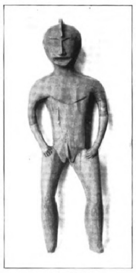
New Zealand. Bark baskets, jade earrings, 2 splendid jade mere, many heitiki mounted on mirror to show backs, bailer with penis handle. Carved wooden coffin or bone-box with bones only, no skull. Pump-drill, the fly of 2 wooden arms bound by a bark rim.

New Britain. Noted that the musical instrument peculiar to this group is called "Biulapaganey" (Fig. 210).

Solomon Islands. Wooden shield with mosaic decorations of squares of pearl-shell; the best specimen of this work seen.

New Guinea. Cuirass of *Calamus rotang;* 6 pan-pipes, 1 with 24, the rest with 13 reeds; 2 coffins of canoe form with covers. Spears tipped with cassowary bones were labelled "Lauka". Many gourd penis-covers; 2 gourd whistles like the Hawaiian *Ipu hokiokio*, with 3 holes.

The fine Mexican feather-work for which this museum is noted seemed much faded since my last visit.



215. HAWAIIAN IDOL.

MUNICH. Königliche Ethnologische Museum in the Arkaden. Custos Dr. Walter Lehmann.

Hawaiian Islands. Feather helmet, rather small, of the usual red and yellow feathers with a narrow V-shaped black stripe on the sides. Feather cape of red with a narrow band of yellow; 5 ulumaika, 3 poi-pounders, 8 stone adzes, 10 good ohe kapalapala, niho palaoa in poor condition; 2 leiomano of ordinary form, 2 with 1 tooth each; kukui nut candle 15 in. long; ipuwai pawehe, lei of dog-teeth, anklet of dog-tusks. Idol of wood with a crest (Fig. 215); another with helmet (Fig. 217), and a remarkable human figure with uplifted arms (Fig. 216).

Australia. Seventy, more or less, stone churingas, well cut; 6 horned boomerangs, and several of the large carved ones. Many ceremonial shields with emu down tufts and other ornamentation. Pitties and shields of common quality and form.

New Guinea. Remarkable pottery from the southern part of Dutch New Guinea with raised designs evidently copies of wood carvings; there were large shields and a number of other things in this collection new to me.

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216. HAWAIIAN FIGURE. 217. HAWAIIAN IDOL.

Many carved pillows; 2 fine dukduk masks, 1 of braided sinnet represents a bird's head with long, open bill.

New Hebrides. Two fern figures from Malekula.

New Britain. Three musical instruments=friction drums (Fig. 210).

New Ireland. Many chalk figures of more than usual good quality—one a double one, male and female back to back—none of them so indecent as often the case.

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Admiralty Islands. Large bowl, 3 large totem poles with lizard in relief. Combs of considerable size and novel design. A few Matty Island articles.

Marquesas Islands. Two clubs and the head of another; 6 stilt rests.

Fijian Islands. Many clubs; inlaid pillow of fine quality.

Gilbert Islands. Coconut fibre armor of the rare form with high collar, of which we were promised a photograph.

Solomon Islands. Dancing flaps of novel form; hermaphrodite figures, of which photographs were promised.

Miscellaneous. Fine Maori mat cloak; good Tahitian kapa-beater; Rapanui figures; Samoan and Tongan clubs. Mangaia carved paddles and adze handles, 1 of the former being carved in a mat pattern I had not seen before, but since have found a similar one in the Field Museum in Chicago.

The Oriental collection was grand, recalling the Musée Guimet; large gilded Buddhas; fine polished carvings from *Tridacna gigas*, jade and ivory in great quantity; lacquer galore. The Persian stone sculptures and pottery (many collected by Dr. Lehmann) were in great number and of fine quality.

DRESDEN. Zoölogische und anthropologische-ethnologische Museums, Im Zwinger. Dr. Arnold Jacobi, Director.

Hawaiian Islands. Three beautiful feather cloaks, 1 with green feathers; 1 cape, of which we are promised photographs; 8 kapa-beaters, kapa board, kua kuku, 2 clubs, shark-hook, wooden idol, lei niho palaoa, ipu huewai, poi-pounder, specimens of kapa, piece of basket-work.

Micronesia. Model of a Marshall Islands chart or mede. Armor of coconut fibre of the rare form from the Gilbert Islands; 3 suits of the common form. Shark-tooth cutter similar to the Hawaiian.

Samoan Islands. Spears, clubs (tooth-of-death), paddles, mat work, kapa-beater, shark-hook, grindstone for adzes, whale-tooth ornament, poncho, 39 combs, 4 carved wood combs, 8 ornamented fans, 7 awa bowls; 2 bambu pillows (4 ft.), 2 ditto 2 ft. long; basket, 3 adzes, 3 upete, tatuing implements, 6 adze blades, 2 paddles, shell and pearl ornaments.

New Zealand. Ten carved figures and house ornaments, 3 phallic bailers, 19 feather boxes, 3 carved bowls, 5 clubs with carved handles, 16 greenstone mere, several baskets, 2 tewhatewha from the Cook collection, 2 wooden images from the same, 6 carved flutes, phallic flute, 3 jade heitiki; 3 jade mere, 1 fine one given by Dr. Julius Haast; kiwi feather cloak, 2 patu of carved wood, bone patu, greenstone patu, carved slab with 3 men and 2 dragons. Cast of an heitiki in the Freiburg Museum.

Marquesas Islands. Three splendid clubs, carved stilt rest, human bone ornaments.

Hervey Islands. Carved food scoop. Five carved paddles from Mangaia. Eleven spears, 2 very large ones; stool, drum, fans, basket.

Tongan Islands. Twenty-six clubs, pillow, 4 combs, 2 baskets, 1 beaded basket.

Fijian Islands. Inlaid pillow; 2 ditto 5 ft. long; 2 of bambu, 2 plain. Seven pieces of pottery, large double yaqona bowl, 2 kapa-beaters, kapa board stamp, cannibal dish, model of temple in sennit, 6 fans, 7 bowls, 2 adzes, 5 baskets, ornaments, 20 throwing-clubs, 3 lotus clubs, 3 pineapple clubs, 12 musket clubs, 4 knobbed clubs, 9 carved paddles, 2 spears.

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New Caledonia. Ten phallic clubs, nephrite disk club, 3 other clubs; 4 death-masks, 5 adzes, 5 shields, spears, throwing-club, figures.

Solomon Islands. Large collection of clubs, spears, paddles, bowls. inlaid shield like the one in Munich.

Australia. Twenty-two nulla nulla and waddy, 5 wommera or spear-throwers, 13 shields, 8 hammers, small bark canoe, 2 pump-drills, 6 decorated breast shells, 7 bewitching-sticks, stone knife for *mika* operation, boomerangs in great number.

New Guinea and Bismarck Archipelago. Dancing-masks, a fine series; strings of shell money, money chains; 8 rattan nooses used by head hunters (Fly River); 2 carved figures. Carved drum (South New Guinea); another with shell rattlers; 3 of common form. Star stone club with 11 points to the stone star; another with 4 points. Many and good chalk images from New Ireland. Large series of charms from Hermit Islands, usually a lower human jaw corded, and decorated with feather and stick pendants. Two adzes with jade blades (Fig. 218). From New Britain, carved wood images; 2 pump-drills with stick for fly; carved wood figure, life size; 8 masks of the frontal portion of human crania dressed with gum; 3 lower jaws, canoe bailer with handle joined to back and bottom.



218. ADZE WITH JADE BLADE.

The Admiralty group, including Matty Island, was well represented here.

LEIPZIG. Museum für Völkerkunde [Grassi Museum]. Prof. Dr. Karl Weule, Director.

Tongan Islands. Clubs, paddles, fans, baskets; a good collection.

Fijian Islands. Fine lotus clubs and a good general collection.

Marquesas Islands. Five carved boxes, 4 stone figures, carved paddle, 3 clubs, model of a double canoe (Fig. 218 A).

New Zealand. Five carved boxes, many adzes, clubs, paddles, 2 mokoed heads, 6 mere, 9 heitiki.

Admiralty Islands. Twelve large human figures; large bowls.

The collection from New Guinea and the Bismarck Archipelago was too large to catalogue in the time at our disposal. The whole museum is very attractive and worth a much longer study.

COLOGNE. Rautenstrauch-Joest Museum [Städt. Mus. für Völkerkunde]. Dr. Willy Foy, Director. Dr. F. Graebner, Assistant.

Hawaiian Islands. Bearing-stick, spear, lei niho palaoa.

Society Islands. Large kapa-beater from Tahiti.

Marquesas Islands. Club, paddle.

Hervey Islands. Nine carved paddles, 3 ceremonial adzes.

Tongan Islands. Fourteen fine clubs, baskets, kapa specimens.

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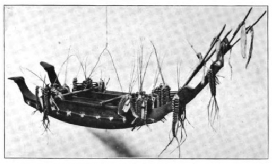
Samoan Islands. Twenty clubs, siapo specimens, kapa-beaters, 2 awa bowls, pillow, fans, mats, baskets.

New Zealand. Carved flute, feather-box, mokoed head, 2 bailers, 3 heitiki.

New Caledonia. Eight clubs, spears, adze with short handle, tapa-beater, basket.

New Ireland. Ten of the peculiar musical implement, a full set, the only one seen in any museum on the trip.

Admiralty Islands. A good collection from these, including Matty Island.



218A. MODEL OF DOUBLE CANOE, MARQUESAS.

Micronesia. Two drums, 7 adzes from Marshall Islands, and a good collection from the Gilbert Islands.

Santa Cruz. Tapa-beaters, paddles, 2 bowls, bailer, 3 pillows.

New Guinea. Twenty spears, 6 shields, 29 human bone-scrapers or daggers, 5 clubs, 8 spear-throwers, baskets, ornaments, 5 adzes, all from Halzfeldhafen. Four water pots, 3 scrapers or daggers, 11 bowls, spears, 10 drums 3 head-masks, rattle, straw shield, all from Astrolabe Bay. Fifteen drums, 3 masks, 2 hats, combs and ornaments, figures, from Finschhafen. Dutch New Guinea: 21 head-masks, paddles, pillows, 11 bowls, 3 large signal drums, 11 drums, large and small figures.

FRANKFURT AM MAIN. Städisches Völkermuseum. Dr. Bernhard Hagen, Director.

Hawaiian Islands. Stone to cook birds; fish-hook, squid-hook, stone lamp, 3 ulumaika, poi-pounder; niho palaoa; another without the human hair band; moa.

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: ceremonial adzes. Tongan Islands. Two good clubs.

Samoan Islands. Two bowls, 15 clubs, 3 adzes, combs, siapo, baskets.

Marquesas Islands. Paddle, club and staff.

Hervey Islands. Three carved paddles, 2 ceremonial adzes.

Tongan Islands. Two good clubs.

New Zealand. Three tiki, 2 house ornaments, carved box (Fig. 86), 5 tiaha, flax-pounder, 6 ornaments, ceremonial staff, 3 paddles, mokoed head, carved flute, 2 greenstone mere, heitiki, carved adze handle, 3 feather-boxes.

Fijian Islands. Pillow, paddle, several spears, 3 pineapple clubs, 5 plain clubs, basket, kapa specimens; pineapple club, very large, 8 in. diam.; yaqona bowl 2 ft. diam.; 3 wigs, adze, kapa-beater, 2 bows, file 3 ft. long.

New Guinea. Fifteen adzes, 2 signal drums, 14 drums, 21 masks, ceremonial adzes, pottery, bailers and pillows; bags and bowls, 14 spears, 9 clubs, 7 decorated spears, 28 bone daggers, 16 shields, ornaments.

Australia. Two horned boomerangs, 100 stone churingas, 75 wood ditto, spears, shields, boomerangs, bowls.

New Caledonia Fifteen bird-bill clubs, 7 phallic clubs, complete adze, 2 long adze handles.

Solomon Islands. Combs and a fair general collection.

New Britain. Two of the peculiar musical instruments.

Admiralty Islands. Six bowls and 5 spears.

Micronesia. Twenty-one spears and 3 shields from Gilbert Islands.

Bismarck Archipelago. A fair general collection.

PARIS. Musée d'Ethnographie (Palais du Trocadéro). Conservateur, Dr. Verneau.

Hawaiian Islands. Feather Kukailimoku, helmet, 3 specimens kapa, 4 ipuwai, 2 umekes, 15 kapa-markers, 4 kapa-rulers, 4 kapa-beaters, 2 niho palaoa, model of canoe, drum of wood and shark-skin, 2 spears, ring poi-pounder, mounted adze, laau lomilomi, 2 idols. Several objects labelled "Hawaiian" which came from other groups.

Samoan Islands. Paddles, siapo, spears, ornaments.

Tongan Islands. Sixteen clubs. Collection of spears on wall.

Hervey Islands. Seven ceremonial adzes, 4 especially well-carved paddles.

Fijian Islands. Seven clubs, spears, paddles, adzes, pottery; much mixed.

New Zealand. Two feather-boxes, 2 patu, several adzes.

Easter Island. Seven small figures, double-headed figure, flute.

Solomon Islands. Large bowl, inlaid shield, clubs, spears and common shields.

New Caledonia. Twelve figure masks, infant coffin, 2 short-handled adzes, stone clubs, figures, basket, 15 fans, 2 door-posts; 52 clubs, common; 8 bird-bill clubs, several phallic clubs, house beams, shell and other ornaments.

New Guinea. Spirit house, 5 drums, 2 shields, 3 pillows, many plain adzes, 3 ceremonial adzes, masks and figures.

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Marquesas Islands. Five head-dresses; complete pair of stilts with original rests and binding (best seen); figures, 6 carved stilt rests, 2 clubs, carved box of inferior quality, carved bailer, 4 paddles, 2 poi-pounders.

Much of the material being arranged as trophies on the walls, and out of reach, it was impossible to classify. The good material formerly in the Musée de Marine has been distributed and did not appear.

PARIS. Musée d'Artillerie (Invalides).

Besides the merely military implements were found on the walls and in table cases the following:

Two New Caledonian adzes of the short handle form, jade disk club from same group. Marquesan club, several Samoan clubs, 2 Hervey Islands ceremonial staffs, Fijian staff. The Hawaiian cloak, helmet and lei used to cover one of the models are nearly featherless.

LONDON. Royal United Service Museum in Whitehall Palace.

Arranged on the walls of the entrance are many fine spears and clubs that do not appear in the following list.

Hawaiian Islands. Helmet of good form with broad crest, of plaited rush, with no signs of feathers. Drum of coconut wood well carved and with shark-skin head. Kupee ilio of large size but discolored and dilapidated. Two boar-tusk bracelets, one of entire teeth, the other of cut ones. Newa of kauila wood. Knife of shark-teeth of unusual form, open in the middle, with nine teeth on each side and one at the end; another of common form with eight teeth.

New Zealand. Mere of greenstone 19 in. long; another almost as large; 5 of common form, 2 of jade. Patu of carved wood, 3 of whale rib; 3 greenstone adzes; canoe stern, rather small; 4 taiaha, 2 tewhatewha or battle axes.

Tongan Islands. Drum of wood, the lower half of the cylinder elaborately carved, as are the lugs for attaching the cords which tighten the drumhead. Clubs finely carved; a small one in the case of relics of Captain Cook is labelled "given by the king of Owhyhee to Captain Cook". Paddles, large and well carved.

Marquesas Islands. Two clubs of the finest quality; 2 paddles, long and good.

Society Islands. Stone adze with handle; several spears.

Gilbert Islands. Suit of coconut fibre armor with the curious shark-teeth weapons for the fore-arm with nine longitudinal rows of teeth. A suit of similar armor from Nawodo has a hemispherical cap and an upright cape like those in Berlin and Hamburg.

Solomon Islands. Two reed shields, one rectangular, the other with rounded corners; several bows; clubs with fern-plaited covering almost gone.

Fijian Islands. Six war-paddles; club, musket pattern of great size; 5 common ditto, 11 knobbed, 3 pineapple, 11 throwing, a round one 3.5 in. in diameter.

From Niuë several paddles; from New Guinea a bow of bambu; and from the Admiralty Islands spears with obsidian points. The Secretary kindly permitted me to photograph such implements as I desired.

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LONDON. British Museum. Keeper of British and Medieval Antiquities and Ethnography, Sir Charles H. Read. Assistants, O. M. Dalton, T. A. Joyce.

Hawaiian Islands. Seventeen feather cloaks and capes (the feather-work has been fully described in the *Memoirs* of this Museum, I, pt. 1). Two helmets, once feathered (Meyrick collection); 4 helmets with feathers in good condition; 2 helmets in fair condition (Vancouver collection); helmet of wicker-work with detached crest; Kukailimoku (Leverian Museum); 4 ditto, one of them figured by Cook; many feather lei. Two rectangular feather



219.



220.



221.

mats (*Memoirs*, I, Pl. VI; p. 438) possibly used by the kahuna or priest for a rest for the idol; 3 large idols of wood; curious wooden idol with helmet: there are no legs and it was perhaps carried on a pole as was the god Kukailimoku; it is covered neatly with kapa like some idols from the Marquesas (Fig. 219). Another wooden idol with the peculiar form of trimmed hair called *mahiole* (Fig. 220); wooden idol from Kailua (Fig. 14); female idol (Fig. 15); stick idol (Fig. 16). Wooden idol with wide mouth well armed with teeth and with head slightly reverted (Fig. 221). Wooden idol somewhat larger with human hair (Fig. 222); 2 idols of stone taken from Necker Island by officers of H. M. S. Champion (Fig. 13); 2 wooden heads of images, probably idols; aumakua; 5 kahili, small, with bone and tortoise-shell handles; 8 stone mirrors, good; 5 kupee or bracelets of boar-tusks, large (V.[1]); 6 kupee with tortoise-shell; niho palaoa (W. Ellis); 7 common ditto, 1 with four small bone or

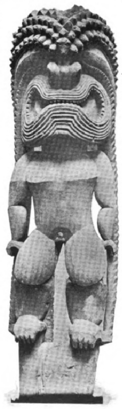
[1] V. stands for Vancouver collection.

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shell niho, and a similar one with six little niho; 2 niho small and broad; lei of small red, white and black shells (V.); leis of *Strongylodon lucidum* seeds and shells of *Patella striata* (V.); leis of *Cypraea moneta* (V.); leis of *Conus* (V.). Hula drum of coconut wood with shark-skin head; another without head; hula drum of coconut wood well carved. Large feathered hula rattle; 2 kupee hula with rows of brown and white *Melampus* shells, 2 of black beans (*Strongylodon lucidum*), 2 of dog-teeth, another of dog-teeth (V.). Drum of



222. GOD WITH HUMAN HAIR.



223. HAWAIIAN GOD.

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coconut wood on which is bound a coconut-shell drum (Fig. 224). Two ipu hokiokio, 6 ie kuku or kapa-beaters, 3 ie kuku (V.); 2 pa'u boards, the larger one said to have been given to Captain Beechey by Queen Pomare of Tahiti. Cleaner for pa'u board; 5 ohe kapapala, common; another with stamp of tortoise-shell; 4 ulumaika, all but one white; ipu aina with inlaid human teeth; ipu kuha or spittoon, square; umeke of wood with cover; 5 huewai pawehe; 2 ditto (V.); board for scraping oloná; 2 poi-pounders, common; 1 of ring form; stone lamp, common form; coil of waoke rope, square braid; 2 gourds, long; many stone adzes, four with handles; 2 umeke covered with plaited roots of ieie (*Freycinetia arnotti*); inamona dish of wood, crescent-shaped; kukui nut candle, 3 tobacco pipes, kilu or top of ipu pawehe. Small mirror in wood frame on top of which are carved two miniature tobacco pipes (Fig. 225). Double canoe model; model of single canoe, no outrigger; 2 carved figures for rests for fish pole in a canoe; carved canoe rest (V.); carved wood female figure for seat. Carved bowl with two figures as supporters (Fig. 11); carved bowl with three supporters (Fig. 10); carved bowl with two



224. COCONUT DRUM.



225. MIRROR.

supporters (Fig. 12); common paddle; newa or hand club of hard lava; 1 of kauila wood; 1 of kauila (V.); ditto with stone head (V.); ihe pahee, large and good; 3 swords of kauila wood with cord lashes; 6 pahu, long and flat, with distinct handles; 15 ihe or throwing-spears; maa or sling-stone, 5 barbed spears, the barbs carved from the thickness of the wood; small ipu le'i to contain fish-hooks; many fish-hooks; 10 wicker disks covered with feathers and with shell and wood knobs (see *Memoirs* of this museum, I, p. 441, for a figure of these eyes); 5 leiomano, 2 ditto (V.); 7 shark-teeth cutters (Fig. 226); 2 rude knives of shark-teeth, one open; shark-hook, sinker for squid-hook, 2 short knives of shark-teeth, fans of ancient form (Fig. 227).

Specimens added from this museum: White coconut bowl, 2 ordinary ditto; coconut awa cup, coconut spoon, ulumaika, 2 hohoa, squid-hook, 2 squid-hook sinkers, strangling-cord; poi-pounder, stirrup form; stone pounder, stone pestle, pair sandals for walking on lava, kua kuku or kapa anvil, carrying-stick, laau lomilomi kua or back-scratcher, pillow of hala, laau melomelo, spoon of coconut, 2 coconut poi bowls, pair ohe hula puili or time-beaters for the dance, 2 ohe keeke of bambu, 2 koko puupuu, kou finger bowl.

New Zealand. Six kumara (*Convolvulus batatas*) spades, common form but some with well-carved rests; several detached rests; 12 tiki or images of large size, 4 carved slabs, 2 carved slabs for pataka or store-house, 3 door-caps finely carved, 2 carved door-posts, 2 canoe stern-posts, 4 canoe models; 2 paddles, common; 2 "bull roarers", 13 tatuing implements, 6 carved

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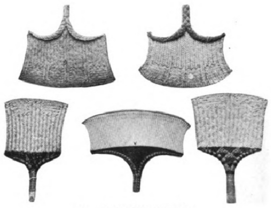


226. SHARK-TEETH IMPLEMENTS.

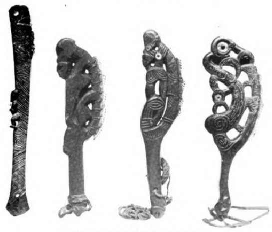
funnels for feeding chiefs during the moko or face-tatuing, carved genealogical stick, 2 balls for the game of poi, 4 mokoed human heads; 8 tiki, small; mussel dredge, 24 taiaha and many duplicates, 8 tewhatewha or battle-axes, 13 mere of jade, 28 jade adzes, 2 heitiki of human skull bone, 28 jade heitiki, 7 jade chisels, many earrings both of jade and of bone, 3 carved adze handles, short; 29 carved boxes for ornaments, etc., one of choice work from Cook's voyage; 14 carved wood and bone whistles; 17 carved whistles, 2 whistles of plain wood, 2 knives of jade for trimming priest's hair, 2 long trumpets (Fig. 17), and another much shorter, 2 trumpets of *Triton* shell with carved wood mouth-pieces, kete of common kind, 2 cloaks of kiwi feathers, many cloaks and capes of *Phormium* fibre, 4 heru or combs of usual form, greenstone adzes in great number, wooden shark-hook carved all over; whale-tooth ornament for the breast, engraved with human face. Carved sacrificial knives with shark-teeth on one edge, the teeth very serrate (Fig. 228). These knives are in several of the Cook collections as will be seen in these pages.

Society Islands. Warriors's belt of small bones strung lengthwise, pearl-shell breast ornament, full dress for mourner (figured in *Cook's Voyage*), 3 gorgets of feathers and shark-teeth on fibre net, dress-cap of feathers and *Ovulum* shells, breast ornament of feathers and square bits of white

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227. ANCIENT HAWAIIAN FANS.



228. MAORI SACRIFICIAL KNIVES.

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shell, 4 stone temple lamps (Fig. 229), wooden shrine for *Tii vahine;* large wooden god, 5 wood carvings like Hawaiian aumakua, 3 wooden gods with hands on sides; 3 figures of ivory, small size; 2 small idols, the taller 10.5 inches, the other decked with ornaments. Tahitian gods not of human form, one, Oro, wrapped in basket-work. Small wooden figure with long legs and very small arms. Small wooden figure with cowrie attached to stem. Carved block of unknown intent, 6.25 in. high. Long cylindrical wooden gong with longitudinal slit, well carved; 3 wooden drums like the Hawaiian, 2 pillows of bi-colored *Pandanus* leaves, 10 lava poi-pounders very well made, 5 kapa-beaters, 2 sunshades (Fig. 245); 4 wooden stools, well cut; 2 wooden boxes for ornaments; 2 smaller, similar boxes; 14 mounted stone adzes, common form; 3 wooden pillows like the stools but lighter; large wicker-work head-dress from Raiatea (see Cook's figure), bailer for canoe, 2 large wooden shark-hooks, netting needle 24 in. long, 4 wooden axes for cutting bread-fruit; large weapon edged with shark-teeth, carried by mourners. Pa'u board exactly like the Hawaiian one "given by Queen Pomare to Captain Belcher".



229. TEMPLE LAMP.

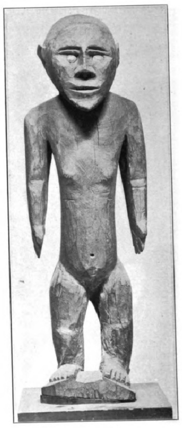
Samoan Islands. Wooden female image 27 in. high, rudely carved, the only Samoan image known to me that could be considered an idol (Fig. 230). Pump-drill, fine; many fans without much variety, tatuing implements, baskets of common work, 3 frontlets of double rows of *Nautilus* shell, upete, human hair belts, 2 stone adzes with handles, 13 stone adzes in the rough, wooden thatching needle.

Niue Island. Six paddle clubs, 5 projectiles of stalactite, many spears with two prongs, spear with stag-horn head, many common spears, staff or pole, canoe model, 12 conical fish-nets, 2 kapa-beaters, siapo figured and fringed.

Marquesas Islands. Six clubs of the finest kind (Fig. 231); 2 pair fine stilts complete, sticks 6 ft. long, 2.5 in. in diameter, chafers of kapa; 8 carved stilt rests, two of them distinctly male figures; 6 long paddles, net for gourd container, several slings, kapa from Egmont Island; 2 gorgets of wood covered with beans of *Abrus precatorius.*

Rapanui or Easter Island. Two large stone figures (in colonnade); 10 male and 2 female figures well carved, 2 rougher work; 2 carved birds and several grotesques, carved human hand, 5 small dance paddles, obsidian lance-heads, rope of human hair; 5 gorgets of wood, the usual crescent form, one inscribed with hieroglyphs. [443]

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230. SAMOAN IMAGE.

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Tongan Islands. Drum 52 in. long, carved; cylindrical gong, 5 adzes, 14 combs, 7 heavy paddle-head clubs, food-hook with disk, club with tobacco pipe worked through the head, mats of open-work, 2 aprons of bird bones and shells (Fig. 234), 2 baskets of fine sennit-work (Fig. 233), and boxes covered with basket-work, large kapa-beater; many pillows of carved wood (Fig. 197), and others of bambu like the Samoan; canoe model, bows, many fish-hooks of the usual heavy pattern.



231.

Hervey Islands. Five carved food-scoops; ceremonial adzes, 10 short, 10 long, one 5 ft. long; kapa with black figures, 2 stalactite pounders; 22 carved paddles, one with double end, four with flat heads, the rest with rosettes; about a dozen duplicate paddles, smaller; finely carved cylindrical drum (Fig. 232), feather caps, god from Aitutaki 49 in. high; goddess from same 20.5 in.; 3 fine open-work district gods from Mangaia, coral rock image 15 in. high; supreme god of Atiu, of curious form. God of paddle form 61 in., bound with sennit. National god of Rarotonga, a long, carved stick bound with sennit and kapa bands making a conical bundle about 13 ft. long; the end of the stick a human head (Fig. 235). Beautifully carved god 94.5 in. long. From Rarotonga, Te Rongo and his three sons springing from his breast, 27 in. high (Fig. 236); carved symbol of Tangaroa, 39.5 in. long, from the great *marae* at Natipaki; squat idol 17.5 in. high. Several other curious bundle idols: all these last from the London Missionary Society collection, now the property of the museum.

Austral Islands. Image of the creative god of the group, covered with figures in relief and hollow within (Figs. 237-238); a cast is in the Bishop Museum. Female figure 24.25 in. high, carved in wood. L. M. S.

Gambier Islands. A large paddle.

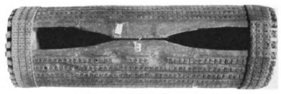
Fijian Islands. Cap of spider-web, a good specimen; 62 pots of various shapes, 5 wigs of human wool; 13 clubs, pineapple form, 31 musket and lotus forms (including the fine one shown in Fig. 239), 13 knobbed, 12 throwing, 6 round, and many duplicates; 14 war-paddles and many duplicates, several ornamental paddles, 6 yaqona bowls; yaqona bowl given by Cakobau, 44.5 in. in diameter, the largest I have seen (one in the Bishop Museum, also from the old king, is 32.75 in.); model of temple in sennit, 2 bambu roll kapa-markers, 3 carved food-hooks; lali or gong of wood, good size; 2 smaller ones; oil dishes in great variety, 2 rolls of sennit, tatuing implements, 2 kapa-beaters, girdle of *Oliva* shells, 4 cannibal forks. Stem of shaddock tree in which are imbedded some of the bones of a chief and his son, relics of a cannibal feast.

Solomon Islands. Two food dishes of large size, 4 clubs covered with plaited fern-stem, many common clubs, package of *Canarium* nut food; 4 pandean pipes, one of irregular form; 8 fish-floats; 6 human figures in wood, small; many longiels, both war and dance; 4 clubs, San Cristobal; 3 clubs of unusual form, 15 adzes with handles, ear-plugs of wood with inlaid faces, sunshade like the

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Tahitian, 2 Jews-harps of bambu; pump-drill with fly of uncommon form; another with the spindle of palm wood, bulging, fly of bone, circular, handle of bambu; inlaid handle of sceptre, stone head gone; 4 pieces of yellow kapa, also some red, others blue; model of canoe, 2 canoes finely decorated; chief's shield, Florida (see *Brenchley, Voyage of the Curaçoa*). Curved shield inlaid with a fret of pearl-shell squares; wooden shield, 5 shields



232. HERVEY ISLANDS DRUM.

with round ends; 4 with square ends, plain; 9 paddles, pointed; 10 paddles ornamented, some oval; 6 canoe figures; 16 carved bowls, various shapes. Reed-woven skull house containing the skull of a chief of Rubiana; around the skull are rings of *Tridacna* shell; 16 choice spears.



233. TONGAN BASKET.

New Caledonia. Five disk clubs of greenstone or jade, 4 jade adzes, 5 short-handled adzes, 2 long-head adzes, death-mask in poor condition, 2 kapa-mallets, 2 corded calabashes; slings, pouches and sling-stones galore; fish net with shell sinkers, many clubs; clubs of great diameter; club of the bird-bill type but double like a pickaxe.

New Hebrides. Eight Santa Cruz fishing-floats, 4 looms, large human figure, clubs of common form, Banks Island kite made of palm-leaf (Fig. 240). From same group, long wooden bowls and 2 obsolete dresses described by Codrington.[1]

New Ireland. Seven chalk figures, not remarkable. Wooden friction drum from New Britain.

Micronesia. Two suits Gilbert Islands armor; 2 Gilbert Islands cuirasses; 2 gauntlets armed with shark-teeth. Human figure in wood, about 15 in. high, Pleasant Island. Ualan loom of rude form, swords and knives of shark-teeth in great number, Kusaien sword in bone and shark-teeth, Nukulaelae club or axe with blade of turtle-bone, rope of plaited human hair, Caroline Islands mat bed, 3 coconut fibre and 3 fish-skin caps from Gilbert Islands.

From Australia and New Guinea there are many specimens, but none uncommon or not to be found in most good collections.

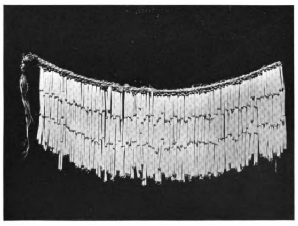
[1] *The Melanesians*, p. 108, "*Malo-saru*".

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LONDON. Royal College of Physicians and Surgeons.

Three Maori mokoed heads, 5 Australian skeletons, 5 Tasmanian skeletons, many Maori and other Polynesian crania.

The very fine Tasmanian skeleton formerly in the rooms of the Royal Anthropological Institute has been removed. Other ethnological material pertaining to the human body is to be found in the admirable collection of the college.



234. TONGAN BONE APRON.

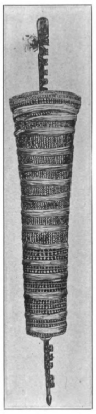
Certain private collections in this city may here be mentioned, although no long list can be given of their often very choice contents.

In the Sydenham Hill home of Mr. A. W. F. Fuller, were the following noteworthy specimens:

Interesting Hawaiian idol, of which we have photographs (Fig. 26-27); some good Fijian, Samoan and Marquesan clubs and paddles; 2 pieces of quilted Rapanui kapa of great rarity: it is said to have taken three years in the making. Several pieces of kapa from the Cook collection. Excellent drums from New Guinea. Several good Maori flutes. Good Solomon Islands collection. Australian message-sticks and dishes.

In the home of Mr. Harry G. Beasley, The Cottage, Abbey Wood, Kent, were the following interesting specimens, and it should be noted that both

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235. RAROTONGAN NATIONAL GOD.

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236. TE RONGO.

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237. CREATIVE GOD OF AUSTRAL GROUP.

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238. CREATIVE GOD OF AUSTRAL GROUP. (BACK.)

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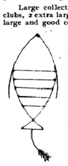
239. FIJIAN LOTUS CLUB.

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Mr. Fuller and Mr. Beasley are no careless gatherers of specimens or curiosities. Their specimens are selected with great care and their history and provenance sought industriously:

Large collection of carved Maori feather-boxes. Several good Fijian clubs, 2 extra large pineapple clubs, splendid Fijian club of unusual type, large and good collection of fish-hooks. Maori patu of iron painted green, a fair set of heitiki, 2 Maori flutes. Very large, carved Fijian pillow. Cachelot-teeth necklace from Fiji, the largest seen. Shark's teeth sword with lateral rows of teeth extending half the length of the blade. From the Pelew Islands a table, bowl and carved earrings. Awa bowl. The New Zealand collection was especially fine.



240. KITE.

A little farther away from London was the very interesting collection of Mr. J. Edge-Partington. In this, besides many things from the Solomon Islands, were the following:

Fijian yaqona bowl, 33 in. in diameter; 3 Marquesan clubs; Maori trumpet, better carved than any other seen. New Guinea carved wood head in which to keep pubic hairs. A magnificent Solomon Islands ring of shell, presenting a circular section: this ring was of unusual size.

CAMBRIDGE (England). Baron Anatole von Hügel, Director. The new Ethnological Museum will probably be ready for occupation by the time this report is issued.

Hawaiian Islands. Ring poi-pounder, several of common form, kupee hula ilio, stone adzes, kupee of boar-tusks; huewai pawehe, small but good. Several other Hawaiian things are packed for removal to new quarters.

Marquesas Islands. Several clubs, 2 stilt rests, carved box, several ornaments.

Society Islands. A stone temple lamp with Rev. George Bennett's label on it, and precisely like the four in the British Museum (Fig. 229).

Tongan Islands. Many fine clubs, several bowls, 3 paddles.

Samoan Islands. Two *Nautilus* shell frontlets, many good clubs, stone adzes, several combs.

Hervey Islands. Six ceremonial carved paddles and a ceremonial staff.

Rapanui or Easter Island. Carved lizard, double paddle; gorget of wood, usual crescent shape; human figure.

New Zealand. Canoe model; bailer, broken; 3 carved kumete, mokoed head of good quality, carved funnel for feeding chief during the process of moko; flax-pounder with head carved on the stone handle; 3 mere of bone, 1 of jade, 3 of carved wood; patu of bone and a small one of wood; 3 tewhatewha, carved whistle or fife, 2 carved small whistles, 3 paddles, prow and stern of war-canoe, jade adze in carved handle, 9 heitikis of jade, 2 jade ornaments, bone heru or comb; 5 earrings of jade, 2 of carved bone; large bowl, chief's staff.

Fijian Islands. Sixty knobbed clubs, 4 inlaid; 25 pineapple, 10 lotus, 60 musket, 55 round, 35 throwing, 50 miscellaneous; 28 paddles, one bound with sennit, seventeen carved; 70 spears, some finely carved; 84 pots, one tripod, three tortoise-shaped, two cooking; 20 carved wood pillows, 15 kapa-

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beaters, 20 cannibal forks, 30 cannibal dishes, 49 carved wood dishes, 5 yaqona bowls, 40 oil dishes, 35 wooden dishes on stand, 5 strainers. Large number of yaqona cups, 3 coconut cups, 9 nose flutes; 3 upete of leaves, 1 of wood; 5 bambu marking rolls, 5 shark-hooks, 12 fish-hooks, many netting needles, 14 collars of whole teeth, 3 trumpets of Triton shell, 3 girdles of *Oliva* shells, 5 shell gorgets, 15 combs of carved wood, 3 canoe models, 20 fans, 5 wigs of



241. LOTUS CLUBS, FIJI.

human wool, models of devil houses, baskets and satchels of various forms; 7 liku or fringed dresses, and many common ones; large collection of adzes.

This is certainly, both from the quality and number of specimens, the best Fijian collection seen in any museum.

New Guinea. Eleven shields of wood, 4 of hour-glass form, 2 plaited.

New Caledonia. Death-mask in poor order, many clubs of the usual pattern.

Solomon Islands. Paddle and club, both plaited with fern; large canoe model, 4 shields, 4 longiels; large food bowl and 3 smaller ones, 2 canoe figures, 3 bows, many arrows.

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OXFORD. Ethnological Museum [Pitt-Rivers collection]. Henry Balfour, Esq., Director.

The size of this museum must not be judged by the paltry list here given of the contents. The comparative system of arrangement makes it impossible to list specimens geographically in a hurried visit. In musical instruments a worldwide collection has been made of the greatest interest.

Hawaiian Islands. Kukailimoku with human hair and teeth, plain shell eyes (no wood pupil as usual), and the feathers gone (figured in *Memoirs* of Bishop Museum, I, p. 440). Feather helmet, also devoid of feathers; 2 fans, 2 boar-tusk bracelets, stone sinker, 3 ornaments, carved Bloxam idol (Fig. 33), small female idol, some good kapa.

Fijian and other Groups. The Fijian lotus clubs (Fig. 241) were very interesting; there were also spears. Clubs from Marquesas, female household idol from Tahiti, large bowl from Solomon Islands. Good series of pump-drills.

BERNE. Bernisches Historisches Museum. Dr. Rudolf Zeller, Konservator d. ethnogr. Sammlung.

Although this museum was not visited on this journey, it was carefully examined on the previous expedition in 1896, and as the most important portion of the ethnographic collection was from the Pacific, and of old time acquisition, it has seemed well to repeat the former notes.

Berne was the home of Wäber (*anglicè* Webber), the artist of Cook's third voyage, and to the museum of his native town were bequeathed the many articles he brought home from the Pacific region. These have been better preserved than the *spolia* brought by other members of the expedition and are now in the fine building of the Berne Municipal Museum (Fig. 242). With these relics are exhibited a miniature and an oil painting of the artist.

Hawaiian Islands. Feather cloak about 60 in. long, red with yellow decorations (figured in *Memoirs*, I, p. 449). As this is sealed up in a glass case placed within the general case, it is difficult to examine or photograph. I have, by the kindness of the then Curator, a water-color drawing of the cape and helmet. Feather helmet (*ibid*, p. 447); feather lei, red, black and yellow; ulumaika of white stone, 5 shark-hooks with bone tips, 2 niho palaoa much decayed, the smaller of bone (?); kupee of bone and tortoise-shell; other of boar-tusks (fragment); 2 anklets of net-work covered with white shell; dagger of kauila, slim and flattish; lei of thirty fine *Carelia* shells (labelled "Society Islands"); knife of kauila with one shark-tooth, Niihau mat figured but much faded. Knife of kauila with six teeth, through the handle a square braid of oloná cord. Tortoise-shell rings with one shark-tooth neatly riveted to the junction of the flat bands; a murderous weapon used as a leiomano (Fig. 243); maa or sling of braided fibre cords and a closely plaited cap; 3 kapa sheets, fine, white; another chocolate and brown; coconut cup.

Society Islands. Cylindrical corded drum (perhaps Tongan); wooden spatula, tatuing implements, sunshades of fibre (Fig. 245), gorget of the usual Tahitian form, adze attached to handle by braid of hau fibre (Fig. 246), adze of much smaller size but complete; bambu flute ringed with braid, decorated with human figures (Tongan?); net-work about 44x8 in., fine with red and green figures; fly-flap with bone handle; mat woven black and red with fringed

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edges. Breast ornament of strips of pearl-shell, six rows of varying width. Necklace of black seeds alternating with white shell disks. Satchel with flap cover. Pearl-shell ornaments, probably the remains of a breast-plate.

Tongan Islands. Curious basket with white shell disks (a few are black) at all junctions of the brown and black triangles forming the pattern of the plaiting, as shown in Fig. 232. Carved club of fine workmanship, human figures; 2 plaited satchels, pan-pipe with ten irregular reeds, braided cloak with fringe, plaited cape with border resembling Maori work, 2 mat capes with braided fringe, 2 kapa sheets with brown figures and white borders



242. BERNE MUNICIPAL MUSEUM.

resembling Samoan siapo; long strings of bird bones. Fine pandanus mat from Wäber. Necklace of the rims of *Patella* shells on twisted cord, wooden pillow; oblong basket, black plaiting with brown decorations; 3 strings of dark brown shells, square basket of unusual weaving, open-work mats of curious pattern (Fig. 244).

New Zealand. Greenstone mere, 2 greenstone adzes, 3 ear pendants of jade, 3 bone needles, stone used for breaking an enemy's canoe (Fig. 247), same as Hawaiian implement; fish-hook.

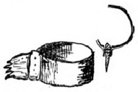
Fijian Islands. Three carved spears; 3 clubs musket form, 3 knobbed, 1 throwing; whale-tooth ornament; 2 necklaces, one with nine, the other with twenty-nine cachelot teeth; war-paddle, 4 stone adzês, 2 adzes, short and with handles; bambu pillow (Samoan ?), 2 spoons of turtle bone, net with stone sinkers and wood floats; 2 pillows of wood, common form.

Solomon Islands. Canoe figures. Club covered with fern braid and labelled "Chief's club, Samoa". [456]

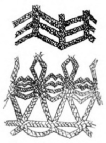
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New Caledonia Club of wood with stellate head; 2 clubs, bird-bill form, small; 2 common knobbed clubs, 2 fringed dresses, braid-covered calabashes, fan, sling and 5 sling-stones.

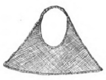
Also a Samoan canoe model and a Rarotongan ceremonial adze. So many specimens were incorrectly named that it was difficult to rightly attribute them without a more careful examination than was possible during a short visit, and therefore many specimens have been omitted from the list, but of these few important ones.



243. WEAPON.



244. TONGAN MAT.



245. SUNSHADE.



246. ADZE.



247. CANOE-BREAKER.

SYDNEY. The Australian Museum. Robert Etheridge, Jr., J.P., Curator.

In addition to an excellent general collection this museum possesses the interesting Cook collection that was offered to the Bishop Museum many years ago. This was carefully catalogued by Mr. Wilson, and we had intended to spend several days here, as the museum was well worth the time, but a letter of the Trustees requesting us to visit Christchurch and Dunedin in New Zealand cut our time short and we were unable to catalogue the collection as we desired. Not only is the Australian collection very complete and valuable, but it has considerably increased since my last visit. Specimens

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from the Bismarck Archipelago and New Guinea are very numerous and attractive. Omitting the mere relics from the Cook collection, the ethnological matter remaining is as follows:

Bone neck-pendant, shark-tooth knife (*Carcharias lamia*), ivory finger ring; jade ear-drop 3.5 in. long, others 2.75 in. and 2.25 in. long; jade ear-drop, ornament of orange cowry, 2 woven armlets, Maori patu, 3 spear-throwing gaskets from New Caledonia, Tongan comb, Maori paddle, Tanna Island comb; pan-pipe, New Hebrides; Queensland waddy, pandanus cloak, frame of kapa specimens, piece of Tahitian kapa; sling pouch, New Caledonia; large Tahitian bag; chief mourner's dress, Tahiti; piece of fibre matting; piece of Tahitian kapa, Tahitian cloak; boat-shaped fish-hook, New Zealand; Maori shell fish-hook, Tahitian fish-hook; 3 large Tahitian pearl shank fish-hooks, 2 smaller ditto; 11 other Tahitian fish-hooks; 4 ceremonial paddles, Mangaia; 28 specimens of kapa collected by Cook in Pacific, Maori chief's staff, Maori axe handle of whale rib, Tahitian fish-net, New Caledonian bird-bill club, Maori shell necklace, 2 New Caledonian wooden hair-pins, Tongan shell necklace, meshing needle, 17 adzes, 4 greenstone mere, 4 Tahitian adzes complete, 2 Tongan clubs finely carved, paddle-shaped club, small Tongan club; 2 taiaha, New Zealand; 4 Hawaiian hair necklaces, Tahitian gorget; 2 white shell forehead ornaments, Marquesas; 2 Tahitian daggers; shell necklace, Niuë; New Caledonian club; Fijian pineapple club, plain ditto; Tahitian nose flute, Tahitian shell necklace (*Planaxis niger*), good Fijian pineapple club, bailer for canoe, jade ear-drop 13.5 in. with stained flax tassel. Hawaiian feather helmet (no feathers), Hawaiian feather capes.

BRISBANE. Queensland Museum. Director, Dr. Ronald Hamlyn-Harris, F.R.M.S., F.Z.S., F.E.S., etc.

This museum well deserves a long mention and the list of its treasures should be large, but years of almost neglect require much regenerative work. The new Director has made a most promising beginning in the new quarters, and I trust at my next visit to make a very long list. Now it must be short, for many of the collections are not yet in place. The Director is describing in the museum publications some of the very interesting specimens under his charge.

Two mummies from Darnley Island, of which this museum has long had photographs. Many good Australian shields. Fine collection of adzes. The specimens from New Guinea are numerous but we were unable to make even a short list of them in the brief time at our disposal.

DUNEDIN, N. Z. Otago University Museum. Prof. Dr. W. B. Benham, D.Sc., F.R.S., Director.

While this museum is largely of a biological character, one of its principal benefactors, Thomas Morland Hockens, with his library and picture gallery gave also the following collection.

New Zealand. Seven bone patu, 2 wood ditto, finely carved feather-box, 4 heru or combs, 10 heitiki, jade earrings, 6 mere. Two hoeroa: This rare weapon was made from the jaw bone of a whale; was used as a two-handed sword, or thrown at an enemy with an underhand jerky motion, and was recovered by a long cord attached to the wrist of the thrower. It was used mainly to kill women. Fig. 3, p. 60, Vol. III, *White, Ancient History of Maori*. Two mokoed heads, tatuing set well mounted, 2 taiaha. By purchase from the Hockens sale the museum secured a roll of Santa Cruz feather money 26 ft.

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9 in. long, and other specimens from that group. Among some things attributed to Cook were: Ceremonial adze and paddle from Mangaia, and a Tongan club much like the one in the Cook collection at Wellington.

In the general collection were 2 paddles from Solomon Islands and 1 from New Ireland; Gilbert Islands spear; from New Caledonia, 2 bird-bill and 2 common clubs; 9 New Hebrides clubs. From Fiji, 6 musket, 2 pineapple, 1 throwing and 6 common clubs.

CHRISTCHURCH, N. Z. Canterbury Museum. Edgar R. Waite, F.L.S., Curator.

In addition to a good Maori house and many specimens of Maori house carving, the Maori collection is very good and well explained in the guidebook. A few only of the specimens can be mentioned here.

Australia. Stone axes for cutting steps in trees; cundi-stone, a sharp flint used for circumcision; Mulga and Geeam shields, wommera or throwing-sticks of many forms, waddy and boomerang of most known forms, fire-sticks or drills, witarna or bull-roarer.

Melanesia. Two chalk figures from New Ireland: it is here stated that these are ghost-catchers and serve as habitations for the spirit of the departed as do the Egyptian Ki. Melanesian drums of hour-glass shape.

New Caledonia. Two mounted stone clubs, one of jade, the other of basalt; 2 jade axe heads; 2 wooden momo or dancing-masks, decorated with feathers and tufts of human hair; sling, pouch and sling-stones; comb, spears, food-pounder.

New Guinea. Head ornaments of feathers of cassowary and bird-of-Paradise, or of hair from pig's tail. Pan-pipes and bambu mouth-harp, carved coconut water-bottles, food bowl, man-catcher and pig-catcher, large net with perforated shells for sinkers; stone adzes, some mounted. A "grave axe" only used to bury with a chief; in due time it is dug up. Many arrows.

Santa Cruz Group. Roll of feather money, loom for dress weaving, dancing-rattles, large canoe model, arrows, ornaments of various kinds.

Solomon Islands. Canoe, pandean pipes of four kinds, wooden food bowls inlaid, fish-hooks of various kinds, spears and arrows, combs, spoons of shell and of coconut, carved wooden figure, lime-boxes, shell war-trumpet, stone adzes.

New Hebrides. Dancing-mask and spider-web cap from Malekula. Bows and arrows. Pottery.

Fijian Islands. Pottery, a large assortment; cannibal relics, a tree-stem with enclosed human bones, brought by the Government troops in 1876 from the town of Lasi-lasi in the mountains of Viti Levu. Four-pronged cannibal fork, model of a double canoe in the old style, lali, model of a bure, yaqona bowls, fine old basket, 2 pillows, throwing and other clubs, paddles and paddle-shaped clubs, teeth of sperm whale, fire-sticks for plowing in the Polynesian way, oil dishes, wigs, liku and kapa specimens.

Samoan Islands. Model of house; spears and clubs; fans and baskets from Upolu. Tatuing implements, model of large fishing canoe, kapa-beater and upete, chief's plaited girdle of coconut fibre, siapo specimens.

Tongan Islands. Shell trumpet, combs, fish-hooks, shell baits and sinker for catching octopus.

New Zealand. Models of various canoes. Feather cloak of kiwi feathers, another of feathers from the native pigeon, 3 dog-skin mats, many

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flax garments, Korowai mats, model of Hone Heke's pa at Ohaeawai; model of Tawiti's pa, Ruapekapeka; 2 smoke-dried human heads, heru or ornamental combs; heitiki, a good assortment; jade ear-pendants, fire-sticks, bird snares, fish-hooks, pigeon mats, baskets of totara bark, ko or Maori spade, pestles for pounding fern root, stone and iron adzes mounted, pump-drill, specimens for showing the methods of stone working. Carved feather-boxes in which were kept the feathers of the huia and white heron used by chiefs alone for head decoration. Shell trumpet; flutes or fifes (Maori had no drum), whipping-tops, poi-balls, jumping-jacks. Taiaha of which the tip represents the protruded human tongue. Mere and patu. Toa and pouwhenua. Collection of cave deposits. Moriori implements.

There are a few specimens from the Hawaiian Islands, Tahiti, Niuë, Marquesas, Mangaia and Rapanui.

WELLINGTON, N. Z. Dominion Museum. Augustus Hamilton, Director.

Among the remarkable specimens in which this museum abounds must be mentioned the Cook relics given by Sir A. Oswald, of which we have photographs of the feather-work and some other important matters. Here again, by the movements of steamers, we were limited in time and were unable to make list of the representative specimens. Fortunately the Director has published some of the Maori matters in his splendid work *Maori Art*, and in the very useful *Bulletins*.

AUCKLAND, N. Z. Auckland Museum. Dr. Thomas F. Cheeseman, F.L.S., Director.

We were able to spend more time in this museum than in the other museums of New Zealand, and it is certainly a museum where time may be well spent. Like all the Colonial museums it is natural history, ethnography and art, but the three divisions here do not encroach on each other, and there is prospect that art may be separately housed in the near future.

Hawaiian Islands. Two small feather kahili; stone pounder, ring pattern; poi-pounder, ulumaika, 4 kapa-markers; finger bowl, very fine; common umeke, calabash, drum, stone bowl.

New Zealand. Seven coffins, some of them remarkably carved (Fig. 248); 8 tewhatewha, large number of stone adzes, 3 hoeroa, several well-carved walking-sticks, many stone and wood flax-pounders, several carved staves; 18 cloaks, flax, kiwi, dog-skin and pigeon feathers; 10 jade mere, 10 greenstone mere; 5 carved whale-bone patu, 6 plain of the same material, 7 carved wood patu, 5 especially fine wood carved patu, carved wood club, whale-bone club, 4 carved tewhatewha, 6 patiti; 12 taiaha, carved; 2 genealogical sticks; pataka, finely carved and old (Fig. 168); large pataka; Maori house, finest seen; war-canoe more than 80 ft. long, plain canoe; many paddles, 5 plain, 3 carved; 8 carved bailers, 2 plain ditto; large collection of Maori fish-hooks, several fish-nets and traps, 7 bone flutes, 4 stone ditto; 2 carved wood flutes, very choice; 2 plain wood flutes, 3 carved war-trumpets, 2 trumpets of large size, 2 carved mouth instruments, 2 mokoed heads, 3 stone hearths, elaborately carved bowl; bowl, plain; 4 calabashes, plain; 2 stone bowls. Ancient carved box found in a chief's grave filled with greenstone adzes. Fine old Maori carvings (Spencer); 9 greenstone ear pendants, 24 heitiki, 5 matau, series of bone combs and ornaments, 12 carved feather-boxes, wood basket, 5 very fine kumete for preserved birds, 2 pigeon pots, 2 models of canoes, 8 carved wood bowls, feather basket, many doorways and prows and sterns of canoes.

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248. MAORI COFFIN, AUCKLAND.

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Samoan Islands. Model of canoe; fine club; plain ditto.

Fijian Islands. Pottery; 4 carved clubs, 9 plain ditto, 4 throwing-clubs.

Solomon Islands. Several canoe models, inlaid; fine inlaid bowls.

Bismarck Archipelago, etc. Paddle and 3 clubs from New Britain, 3 fine bowls from Admiralty Islands, 8 ceremonial adzes from Mangaia, very large war-drum from New Hebrides, armor from Gilbert Islands.

Eddy collection (Maori) not distributed. Fine carvings, 2 bailers; 2 jade mere, 2 bone, 2 stone ditto; bone club, paddle, tewhatewha, 4 taiaha, kite, carved sacrificial knife, tobacco pipes carved.

AUCKLAND. Auckland Library and Art Gallery. Mr. E. J. Shellington, Librarian.

This library was (as already stated) due to Sir George Grey, and his extensive collection of Maori implements, with a few extraneous ones, went with the books. The spears, clubs, paddles, decorated the walls of the stair-way, and could not easily be examined or catalogued, but the rarer specimens were in table cases in the art gallery. Of these the best were:

Hawaiian Islands. Kapa-beater, niho palaoa, stone adze, poi-pounder.

New Zealand. Several fine wood, stone and bone patu; some fine jade mere, 2 jumping-jacks, two-pronged fish-hook, 4 choice carved boxes, 3 carved canoe-bailers, splendid series of heitiki, phallic carved flute. Matua Tonga, or "God of the Harvest". Tradition says it was brought in the canoe Arawa, but the material (red hornblende-andesite) is found on both Mt. Ruapehu and Mt. Egmont, near New Plymouth.

From New Guinea, 2 fine adzes. From Fiji, 2 clubs and several pots. From New Caledonia, 2 bird-bill clubs and several good adzes.

SUVA, FIJI. Suva Museum. Mr. C. Wall, Curator, and Secretary of the Fijian Society.

This museum, situated near the landing between the main street and the sea, is supported partly by the Government and partly by the Fijian Society.

Fijian. Two hundred and thirty bowls of wood, several turtle-shaped yaqona bowls, few cannibal dishes and forks, 21 lotus clubs, 10 pineapple clubs, throwing-clubs, 2 masts of canoes, steering paddle 20 ft. long, model of canoes, 4 human bone sail-needles, good specimens basket-work, stone god, many specimens of pottery; liku dresses, many common clubs, plenty of kapa, kapa anvil, 2 kapa-boards, 10 kapa-beaters, 2 models of "Devil house", whale-tooth ornaments, phallic stones; case of fine wood pillows, especially one used by bridal couple; 4 rolls of sennit, two of them 12 ft. high. Many of these specimens we found were loaned when we tried to arrange an exchange.

Other Groups. Five Samoan clubs; 5 Solomon Islands figure-heads; several paddles; inlaid bowl; inlaid staff. New Guinea star club. Santa Cruz feather money.

In a private collection we found: Large yaqona bowls, several of turtle shape; spears, clubs, shell ornaments, fans, part of an ancient canoe, ancient necklace, several pillows, basket-work, and a number of walking-sticks.

SALEM, MASS. Peabody Academy of Science (Marine Museum). Edward S. Morse, Director.

Hawaiian Islands. Large image of ohia wood from Hawaii (Fig. 249); niho palaoa, good; 2 kupee puaa, good; specimen of feathers of oo; 5 huewai pawehe, 2 plain; 3 fans of ancient form with human hair decorations, 5 kapa-

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229. HAWAIIAN IDOL, SALEM.

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beaters; many good specimens of kapa, plain and decorated; gourd umeke with cover; hinai poepoe, complete; spear, E 4928; model of canoe, E 5342; coconut arm-drum, E 2940; kukui nuts for candle, hula skirt, charm of teeth, wooden bowl; ipu kuha(?).

Society Islands. Two gorgets of feathers, fibre and shark-teeth; fan, E 2631; fine spear, E 4927.

Rapanui. Two long-eared figures. Breast ornament.

Samoan Islands. Fourteen good clubs of the various forms. Several kava bowls. Model of double canoe.

Hervey Islands. Ten carved ceremonial adzes, 2 food scoops; 8 carved ceremonial paddles, all with rosette handles, one with the circle ornament noted in the Field Museum (Fig. 179); another with this ornament but with flat handle, E 5122.

Tongan Islands. Many good clubs; pillow of fine workmanship, E 3203; 14 good clubs.

Marquesan Islands. Five stilt rests, one bound on stick; 6 clubs, one with hair, E 5032; paddle, several long paddles, 7 staves tufted with human hair; coconut with human bone decorations. E 4995; Triton trumpet, 2 human hair armlets, 3 shell gorgets covered with *Abrus* seeds.

Niue or Savage Island. Broom, E 5014; staff or club, E 5054.

New Zealand. Mokoed head; pare, very fine; canoe stern; feather-box, rectangular, finely carved, E 5505; feather-box of common form with spiral ornament; canoe-bailer; tewhatewha with feathers, 2 without; 7 taiaha or chiefs' staves, several fine flax cloaks; 11 mere, stone and bone; 5 patu, wood and bone (E 5503 and 5509 especially fine); 5 heitiki, jade; 3 small carved whistles, carved fife, sacrificial knife about 15 in. long with fifteen shark-teeth, 3 jade ear pendants, good assortment of fish-hooks, greenstone adzes 3 paddles.

Fijian Islands. Two temple models of sennit, one with double spires; 3 lotus clubs; 28 throwing, of which eight are ball-headed, the rest lobed; 4 round; 21 musket-shaped, of which three are bound with sennit and two with white shells; 13 pineapple; 8 knobbed, of which one is bound with strings of white shells and two with sennit; 4 round wooden pillows, of which one is a tripod; 6 war-paddles, of which one, E 4874, seems to have the usual notches (supposed a record of the fights in which it has been used) arranged merely for ornament; necklace of cachelot teeth; small mat, E 3195; 16 or more fine spears, 2 wigs of human hair, several good satchels, many liku or women's dress, specimen of the glazed pottery; cooking jar; woven belt, E 4854; cannibal fork, handled adze, yaqona bowl, fans, fly-flaps.

Micronesia. *Gilbert Islands:* Figure in full armor, including the fish-skin helment and the shark-teeth gloves rare in collections. Full suit of the coconut fibre under armor; coconut fibre war-belt, E 4905, necklace of *Conus* shells, E 5004; 5 shark-teeth spears and many knives and swords of similar structure. Pandanus mat, E 5011; fans. *Caroline Islands:* Fine assortment of tols. Mat bed, E 5012; hat used while fishing on reef, E 5009; several slings; sticks of shells used in dance, E 5006; adzes from *Tridacna* shell; necklaces of sections of coconut shell, E 5005; belts, ear ornaments and bracelets of shells, seeds and fibre. *Marshall Islands:* Pandanus mat, E 5019; head-band, E 5003; rasp of sunfish skin.

New Caledonia. Short handled adze, E 2033; phallic club, E 5026.

New Guinea and Bismarck Archipelago. Fifteen fine adzes including several ceremonial; man-catcher, E 5263; 5 stone ball clubs, 4 stone disk clubs, several other stone clubs, many wooden clubs both plain and carved.

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Hour-glass shield, E 5265; another of similar construction but different shape, E 2035; many feather head-plumes; decorative carvings, E 4997, E 5013; smoking tube of bambu, E 5253; good assortment of lime spatulas; carved box for pubic hair, E 2066-67; many wristlets of rattan, fibre, shells, tortoise-shell, etc.; assortment of fish-nets, drum with lizard-skin head; primitive adze, E 4729; stone adze, dance and war-paddles, many-pronged spears; spear with human bone head, E 4952; several armed with sting-ray spines. Fine dancing-mask, E 5022; other good masks, wooden Jews-harps, many bows and arrows, fine tortoise-shell mask.

New Hebrides and Santa Cruz. Clubs, E 5041-42, E 8911; 2 dancing-clubs from Santa Cruz, E 2547, 5001.

Solomon Islands. Three ordinary clubs of good workmanship, 3 paddle clubs; spears, E 3944-47, E 4930-4937; longiels, E 3906-07; fine fibre shield, basket; ring of *Tridacna* shell, E 5179; many arrows, bows.

Australia. Basket, E 2105; 9 wommera or spear-throwers; 10 boomerangs, two of them decorated with carving; 5 shields, throwing-clubs, bull-roarers. A large collection of spears, arrows, clubs, paddles, baskets, fans, bracelets and other personal ornaments that cannot well be identified by photograph on a small scale. The specimens are authentic, many of them added to the old Marine Museum before counterfeiting was in vogue, and so far as known they form the best collection of Pacific material in the American museums.

The following lists were made by my secretary and companion on the journey while on his way back to New York from Honolulu. His experience with me has made the lists as complete, probably, as if I had been with him. All the museums, except that at Pittsburg, I have previously visited.

CHICAGO. Field Museum of Natural History. Frederick J. V. Skiff, Director.

Hawaiian Islands. Niho palaoa, a hook without hair, water-bottle.

Samoan Islands. Fourteen fans, 14 combs, 5 mats, various ornaments, 6 kapa dresses, 18 sheets of kapa (siapo), 7 kapa-beaters.

Marquesan Islands. Four fine clubs, stilt rest, several human bone ornaments.

Tongan Islands. Eighteen clubs, 3 fish-hooks, adze and unmounted head.

Hervey Islands. Sixteen ceremonial adzes; 28 carved paddles, 2 ditto very fine, one 4.5 ft. long (No. 91,414).

New Zealand. Four feather capes, one of kiwi, all new looking; 2 finely carved paddles, several plain paddles, 2 stone mere, bone patu, 2 feather-boxes, 5 specimens of Maori carving, shark-tooth ornament, 3 specimens of kauri gum.

Fijian Islands. Five musket-clubs, 2 lotus clubs, 2 knob clubs.

Rapanui or Easter Island. One figure.

New Caledonia. Five death-masks, 4 water gourds, 13 door-posts carved with figures, 3 wooden figures, small handled adze, 40 phallic clubs, 14 bird-bill clubs, 5 disk clubs, 15 lime-boxes, basket-work, combs, spears, wrist ornaments, straw dresses, 2 masks, several wooden figures.

From New Hebrides, a small but good collection. Admiralty Islands, good collection of obsidian-head spears. Matty Island, 6 dishes, 6 paddles. New Guinea, a hand club. New Ireland, specimens somewhat mixed. A

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considerable part of the specimens are for the use of students and not on exhibition, but from the specimens exhibited the Pacific region seems very inadequately represented, and it would be better, perhaps, to reserve all the specimens for private study. This is not a condition peculiar to Chicago; it is American.

PITTSBURG, PENN. The Carnegie Museum. W. J. Holland, LL.D., Director.

Hawaiian Islands. Two umeke for poi, dish for roast pig or dog, 2 chief's mats, fan, several specimens of kapa, Niihau mat.

Samoan Islands. Three clubs, 2 fans, specimens of siapo (bark-cloth).

New Zealand. Two greenstone patu, stone adze.

Gilbert Islands. Two belts ornamented with *Cypraea* shells.

New Caledonia. Jadeite axe.

Fijian Islands. Water-bottle, fan of Thakombau, club from King Thakombau (Çakobau); another club, hairpin, 2 bags, 2 bracelets of shells, costume of grass, shield(?), cloth from coco fibre.

Solomon Islands. Four spears.

Australia. Seven boomerangs, 2 shields, club with granite head cemented with wax; waddy, knife with quartz blade set in wax and used for skinning; 6 emu eggs, three carved; shuttle for weaving net; bag, shell horn, 2 match boxes.

New Guinea. Two necklaces, of shell, 1 of dog-teeth; hairpin, club, bow and 12 arrows (W. H. Abbott collection), 6 woven bags, 2 fish-nets, 4 woven belts; 6 woven bracelets, two of horn, three of shell; 3 shell ornaments, 6 mussel-shell knives, 6 boar's tusks used as plane, 6 chisels of kangaroo jaw-bone; 3 pump-drills, wooden shaft, coconut disk; 3 wooden shuttles, wooden bark-beater, 5 rasps of stick armed with fish-skin, 3 sticks sharpened at end, 3 charm-sticks, 3 wooden hooks, 3 dancing-sticks (?), 3 bone daggers, 6 bone needles, 3 small plates of tortoise-shell, 3 bambu paint bottles, 3 lime gourds, 3 stoppers for lime-box, carved spoon of coconut shell, shell trumpet, 2 large shells, 3 bambu Jews-harps, 3 bambu pipes, 4 adzes of jadeite with handles, 3 adzes of jadeite, fragments of obsidian; 9 spears, long, wooden; 4 spears for fishing, 3 wooden swords or short spears, 3 shields, 3 stone disk clubs. (Exchange collection from Riksmuseet, Stockholm.) Five articles of women's dress or ornament, comb of sticks decorated with feathers, comb, cassowary feather ornaments for the arm, necklace of dog's teeth, band studded with *Nassa* shells, plaited bracelet with similar shells, arm-ring of carved shells; bracelet of plaited rattan, red; lime gourd with beads around the mouth, bambu lime-case, fishing line and hook; 2 bull-roarers, used also as lime spoons and as charms. Carving "goam" of wood, carved pillow supported on two human figures, nail of bird's bone; coconut with handle, painted red outside; stone axe, bone dagger, spoon of *Nautilus* shell, coconut water-bottle, drum, spear, spear "kim", fish spear "lao", spear with bambu head, wooden spear, common spear, throwing-stick. Bow with ornaments, plaited sling and string; two other bows. Arrow with bone tip fitted on carved wooden head; 13 arrows of various forms from several localities; 3 throwing-spears, shell trumpet, dagger of cassowary bone, various tools from Collingwood Bay, 2 spears from St. Matthias Island, shark-hook from Matty Island, 2 spears from the Admiralty Group.

There is also in this museum a large collection of Philippine material, but this is out of our bounds in the present enumeration.

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PHILADELPHIA, PENN. Academy of Natural Sciences. Dr. S. G. Dixon, President; Miss H. Newell Wardle, Curator of Ethnology.

Hawaiian Islands. Idol, from W. H. Jones; maa or sling-stone, 2 stone lamps, 8 adze heads, 8 maika stones, 2 ring poi-pounders, 3 common poi-pounders, 3 squid-hook sinkers, squid-hook with sinker attached, 8 cowry shell squid bait, 2 coral sinkers, 5 lava sinkers, 3 wooden umeke, gourd umeke, umeke from T. R. Peale, iron shark-hook with braided string, 2 small hooks, 2 pearl-hooks and line complete, oloná fishing line, ipu pawehe, umeke pawehe, koko of oloná, many fine pieces of kapa, kapa-ruler, hula dress, 4 lei niho palaoa, gourd bowl with bone, human skeleton; mummy of child found in cave in Hanapepe Valley, Kauai, in 1893, wrapped in kapa; stone mirror, various ornaments.

Samoan Islands. Spears and bow, many fine pieces of siapo, several fine mats, man's fishing dress, 4 fans, comb, decorated club, paddle-shaped club, 2 fishing lines, pandean pipes, whale-bone necklace, awa bowl.

Society Islands. Stone adze, tapa, basket-work, native stool.

Marquesas Islands. Carved stilt rest; human bone ornament for head-dress.

Mangaia. Ceremonial adze and carved paddle.

New Zealand. Flax dress, flax bag.

Fiji. Fishing outfit, bambu nose flute, cannibal fork, fish spear, musket-club, pineapple club, knob club, 4 throwing-clubs.

Marshall Islands. Four pearl-shell fish-hooks.

Caroline Islands. Adze, complete, good specimen.

Solomon Islands. Five spears, 4 large spears, 3 dresses.

New Guinea. Spears and bow, war-shield, cassowary plume, comb, tobacco pipe of bambu, coconut spoon.

New Ireland. Mask.

Australia. Nine boomerangs, many rude stone implements.

NEW YORK, N. Y. American Museum of Natural History. Frederic A. Lucas, Director. Clark Wissler, Curator of Ethnology and Anthropology.

Hawaiian Islands. Five niho palaoa, complete; 1 ditto without tooth; 1 lei, 2 large feather cloaks, 1 small cape, all in good condition; 1 Kukailimoku, 1 mahiole without feathers, 12 kapa-beaters, 6 specimens of kapa, 1 stone lamp, 1 ulumaika, 3 poi-pounders, 11 fish-hooks, 2 plain adze heads, 2 gourds.

Marquesas Islands. Two drums, 6 ft.; 2 small ditto; 4 clubs, carved; 2 ditto, not polished; 13 human bone ornaments, carved bowl; idol, 2 ft. high; 3 fans, 4 carved stilt rests, 7 large spears, 3 paddles.

Society Islands. Four straw dresses, 1 ditto covered with shells; 2 spears; 3 canoe models, outrigger type; 2 modern hats, 3 specimens basket-work, house model, 3 adzes, 2 fans, bowl, stool.

Rapanui. Twelve figures; ditto 2.5 ft.; figure part bird, part man; 2 feather neck ornaments.

Hervey Islands. Three plain paddles, 31 carved ceremonial paddles, 19 carved ceremonial adzes, 2 food scoops, fine club, 3 specimens of tapa, 2 carved specimens.

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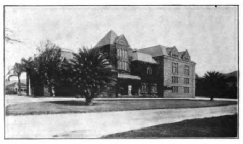
New Zealand. Thirty-five mokoed heads (Robley collection), 10 tatuing instruments, carved funnel, 4 paddles, 3 carved boxes, cover for box, carved figure, 2 stone mere, 6 heitiki, 2 flutes; carved adze with greenstone head, ditto with bone head; 2 bowls, 2 paddles, 12 taiaha, canoe model, several clubs, model of a pataka, collection of greenstone ornaments, dog-skin and flax cloaks, 2 stone figures.

Samoan Islands. Twenty-eight clubs, 18 pieces of siapo (tapa), 4 canoe models, hibiscus mats, 3 bambu pillows, wooden figure, 12 combs, basket-work, 2 tatuing instruments, 4 shells.

Tongan Islands. Five canoe models, 3 carved paddles, 3 carved clubs, 11 spears, specimen of tapa, 2 pillows, bowl.

Niue. Six model canoe, 8 paddles, 5 clubs, 2 spears.

Fijian Islands. Eleven dresses, 12 fans, 14 specimens basket-work, 11 bowls, 3 forks, 3 adzes, 15 pillows, 11 tapa-beaters, 4 tapa rolls, 6 tapa-boards, 13 pieces of pottery, 9 yaqona bowls, 20 paddles; 5 paddles, extra. Clubs: 29 musket, 3 lotus, 28 throwing, 18 pineapple, 10 knob, 6 plain, 2 carved, 5 bone. Twenty-six spears, canoe model, devil house model, many small ornaments, 9 whale-teeth necklaces, 6 pieces head-dress, 3 cannibal forks, 3 large pillows; 5 kava bowls outside cases. (Cases not thoroughly labelled or arranged. Apparently the largest lot of Fijian clubs in any American museum.)



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Bishop Museum Press.
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Director's Report for 1911.

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BISHOP MUSEUM PRESS.
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To the Trustees of the Bernice Pauahi Bishop Museum.

Sirs:—In accordance with the rules adopted by the Trustees on December 15, 1910, I submit my Annual Report on the present condition of this Museum and the work done in the various departments during the year 1911.

WILLIAM T. BRIGHAM,
Director of the Museum.

Honolulu, January 17, 1912.

Ordered printed May 18, 1912.

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HONOLULU, H. I.
Bishop Museum Press.
1913.

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To the Trustees of the Bernice Pauahi Bishop Museum.

Sirs:—In accordance with the rules adopted by the Trustees on December 15, 1910, I submit my Annual Report on the present condition of this Museum and the work done in the various departments during the year 1912.

WILLIAM T. BRIGHAM,
Director of the Museum.

Honolulu, March 7, 1913.

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Report of a Journey Around the World to Study Matters Relating to Museums.

By WM. T. BRIGHAM, Sc.D.,

Director of this Museum.

Life Member of the Massachusetts Horticultural Society. Honorary Member of the Royal Anthropological Institute of Great Britain and Ireland. Corresponding Member of the Berliner Gesellschaft für Anthropologie, Ethnologie und Urgeschichte: Deutsche Gesellschaft für Anthropologie, Ethnologie und Urgeschichte, Hamburg: Senckenbergische Naturforschende Gesellschaft, Frankfurt am Main: Philadelphia Academy of Natural Sciences: Societá Italiana di Antropologia, Etnologia e Psicologia comparata, Florence: Imperial Academy of Sciences, St. Petersburg. Fellow of the American Association for the Advancement of Science: The American Academy of Arts and Sciences: Phi Beta Kappa: The National Geographic Society, Washington.

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The journey began April 10, 1912, and ended December 3 of the same year. Of this a report was made to the Trustees, and by them ordered printed August 5, 1913.

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